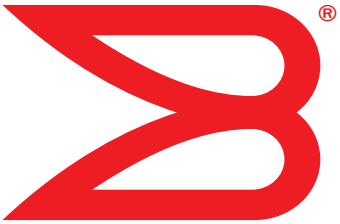
53-1002564-03
12 August 2013



Brocade VDX 8770-8

Hardware Reference Manual

BROCADE

Copyright © 2012-2013 Brocade Communications Systems, Inc. All Rights Reserved.

ADX, AnyIO, Brocade, Brocade Assurance, the B-wing symbol, DCX, Fabric OS, ICX, MLX, MyBrocade, OpenScript, VCS, VDX, and Vyatta are registered trademarks, and HyperEdge, The Effortless Network, and The On-Demand Data Center are trademarks of Brocade Communications Systems, Inc., in the United States and/or in other countries. Other brands, products, or service names mentioned may be trademarks of their respective owners.

Notice: This document is for informational purposes only and does not set forth any warranty, expressed or implied, concerning any equipment, equipment feature, or service offered or to be offered by Brocade. Brocade reserves the right to make changes to this document at any time, without notice, and assumes no responsibility for its use. This informational document describes features that may not be currently available. Contact a Brocade sales office for information on feature and product availability. Export of technical data contained in this document may require an export license from the United States government.

The authors and Brocade Communications Systems, Inc. shall have no liability or responsibility to any person or entity with respect to any loss, cost, liability, or damages arising from the information contained in this book or the computer programs that accompany it.

The product described by this document may contain “open source” software covered by the GNU General Public License or other open source license agreements. To find out which open source software is included in Brocade products, view the licensing terms applicable to the open source software, and obtain a copy of the programming source code, please visit *http://www.brocade.com/support/oscd*.

Brocade Communications Systems, Incorporated

Corporate and Latin American Headquarters
Brocade Communications Systems, Inc.
130 Holger Way
San Jose, CA 95134
Tel: 1-408-333-8000
Fax: 1-408-333-8101
E-mail: info@brocade.com

Asia-Pacific Headquarters
Brocade Communications Systems China HK, Ltd.
No. 1 Guanghua Road
Chao Yang District
Units 2718 and 2818
Beijing 100020, China
Tel: +8610 6588 8888
Fax: +8610 6588 9999
E-mail: china-info@brocade.com

European Headquarters
Brocade Communications Switzerland Sàrl
Centre Swissair
Tour B - 4ème étage
29, Route de l'Aéroport
Case Postale 105
CH-1215 Genève 15
Switzerland
Tel: +41 22 799 5640
Fax: +41 22 799 5641
E-mail: emea-info@brocade.com

Asia-Pacific Headquarters
Brocade Communications Systems Co., Ltd. (Shenzhen WFOE)
Citic Plaza
No. 233 Tian He Road North
Unit 1308 – 13th Floor
Guangzhou, China
Tel: +8620 3891 2000
Fax: +8620 3891 2111
E-mail: china-info@brocade.com

Document History

Title	Publication number	Summary of changes	Date
Brocade VDX 8770-8 Hardware Reference Manual	*53-1002564-01*	New document.	Sept 2012
Brocade VDX 8770-8 Hardware Reference Manual	*53-1002564-02*	NEBS GR-1089 installation requirements were added including air filter..	Mar 2013
Brocade VDX 8770-8 Hardware Reference Manual	*53-1002564-03*	Additional NEBS requirement added for air filter replacement. Changed referenec to availablility of SX and LX transceivers. Changed LED indication for Ethernet management link on MM.	Aug 2013

Contents

About This Document

In this chapter xiii
How this document is organized xiii
Supported hardware and software xiv
What's new in this document xiv
Document conventions xiv
Text formatting xiv
Command syntax conventions xv
Command examples xv
Notes, cautions, and warnings xv
Notice to the reader xvi
Additional information xvi
Brocade resources xvi
Other industry resources xvi
Getting technical help xvii
Document feedback xvii

Chapter 1 Brocade VDX 8770-8 Overview

In this chapter 1
Brocade VDX 8770-8 features 1
Brocade VDX 8770-8 hardware components 2
Port side of the Brocade VDX 8770-8 3
Nonport side of the Brocade VDX 8770-8 4
Brocade VDX 8770-8 line cards 5
High availability 5
Software features 5
Layer 2 5
Layer 3 5
Virtualization 6
FCoE 6
Link aggregration 6
QoS 6
Management 6
Licensing 7

Chapter 2 Installation of the Brocade VDX 8770-8

In this chapter 9

Time and items required. 9
Items included with the Brocade VDX 8770-8 10
Preparing for the Brocade VDX 8770-8 installation 12
Power specifications 13
Environmental requirements. 15
Chassis slots 16
Unpacking and installing the Brocade VDX 8770-8 16
Port numbering 17
Providing power to the Brocade VDX 8770-8 18

Chapter 3 Logging In and Configuring the Brocade VDX 8770-8

In this chapter 21
Preparing to configure the Brocade VDX 8770-8 21
Establishing a serial connection to the Brocade VDX 8770-8 22
Logging in to the serial console port 24
Changing the RBridge ID. 24
Assigning permanent passwords 24
Changing the default account passwords 25
Configuring the IP addresses 25
Setting a static IP address 25
Logging off the serial console port and disconnecting the serial cable 26
Establishing an Ethernet connection to the Brocade VDX 8770-8 26
Customizing a host name 27
Customizing a chassis name 27
Setting the date and time 28
Time zones 28
Time synchronization 28
Synchronizing local time using NTP 28
Setting the time zone. 29
Setting the clock (date and time) 29
Determining installed software licenses 30
Saving your changes 30
Verifying correct operation 31
Backing up the configuration 31
Connecting network devices. 32
Connecting to Ethernet devices 32
Connecting to workstations, servers, or routers 32
Connecting a network device to a fiber port 32
Testing connectivity 32

Installing transceivers and attaching cables. 32
Installing SFP and SFP+ transceivers and cables 33
Installing QSFP transceivers and cables 33
Managing cables 34
Creating Brocade inter-switch link trunks 34

Chapter 4 Monitoring System Components

In this chapter 35
Monitoring overview 35
Determining the status of a line card 35
Line card illustrations 36
Determining the status of a management module. 40
Determining the status of a switch fabric module 41
Determining the status of a power supply. 43
Determining the status of a fan 44
Determining the status of a CID card 46

Chapter 5 Removal and Replacement Procedures

In this chapter 47
Introduction 47
ESD precautions 47
Cable management comb removal and replacement 48
Time and items required 48
Removing a cable management comb. 48
Replacing a cable management comb. 49
Line card removal and replacement 49
Time and items required 50
Removing a line card 50
Replacing a line card 51
Management module removal and replacement 52
Time and items required 52
Faulty management module indicators 52
Recording critical Brocade VDX 8770-8 information. 53
Removing a management module 53
Replacing a management module 54
Switch fabric module removal and replacement 54
Time and items required 54
Removing a switch fabric module. 55
Replacing a switch fabric module. 56

Power supply removal and replacement 57
Time and items required 57
Removing an AC power supply 57
Replacing an AC power supply 58
Removing a DC power supply 59
Replacing a DC power supply 59
Fan removal and replacement 60
Time and items required 60
Removing a fan 60
Replacing a fan assembly 61
Air filter removal and replacement 62
Time and items required 63
Removing an air filter. 63
Replacing an air filter. 63
Module filler panel removal and replacement 63
Removing a filler panel 64
Replacing a filler panel 64
Chassis ID card removal and replacement 64
SFP transceiver removal and replacement 65
Time and items required 65
Removing a transceiver 66
Replacing a transceiver 67
QSFP transceiver removal and replacement. 67
Removing a QSFP transceiver 67
Replacing a QSFP transceiver 68
Cable routing table 68

Appendix A Specifications

In this appendix. 71
General specifications 71
System architecture 71
System size and weight 72
System component weights 72
Ethernet port supported optics 73
Power cords 74
Power-cord notice. 76
Power-cord notice (Japan, Denan) 76
Safety notices 77
NEBS requirements. 77

Regulatory compliance 78
FCC warning (US only) 78
KCC statement (Republic of Korea) 79
VCCI statement (Japan) 79
BSMI statement (Taiwan) 79
CE statement 79
Canadian requirements 80
German statement 80
Laser compliance 80
Safety agency approvals 80
Regulatory compliance standards 80
Environmental regulation compliance 81
China RoHS 81

Appendix B Caution and Danger Notices

In this appendix 85
Caution notices 85
Danger notices 87

Index

Figures

Figure 1	Port side of the Brocade VDX 8770-8 (sample configuration)	3
Figure 2	Nonport side of the Brocade VDX 8770-8 (sample configuration)	4
Figure 3	12x40G line card	17
Figure 4	48x10G line card (48x1G line card similar)	18
Figure 5	48x10G line card (full view and close-up)	36
Figure 6	12x40G line card (full view and close-up)	37
Figure 7	Management module	40
Figure 8	Switch fabric module	42
Figure 9	Power supply	43
Figure 10	Fan module	45
Figure 11	Removal and replacement of the cable management comb	49
Figure 12	Removal and replacement of a line card (48x10G card shown)	51
Figure 13	Removal and replacement of the management module	53
Figure 14	SFM front view	55
Figure 15	Removal and replacement of the switch fabric module	56
Figure 16	Removal and replacement of the power supply	58
Figure 17	Removal and replacement of the fan	61
Figure 18	Removal and replacement of the air filter	62
Figure 19	Optical transceiver extraction tool	66
Figure 20	Optical transceiver with bail open	66
Figure 21	QSFP cable and transceiver with bail open	68

Tables

Table 1	Line cards available for the Brocade VDX 8770-8	5
Table 2	Installation tasks, time, and items required	9
Table 3	Power specifications	13
Table 4	Power demands per component	14
Table 5	Environmental requirements	15
Table 6	Windows serial connection parameters	23
Table 7	Serial cable pinouts	23
Table 8	Default administrative account names and passwords	24
Table 9	Line card LED descriptions	38
Table 10	Management module LED descriptions	40
Table 11	Switch fabric module LED descriptions	42
Table 12	Output for show environment power command	44
Table 13	Power supply LED descriptions	44
Table 14	Output for show environment fan command	45
Table 15	Fan LED descriptions	46
Table 16	Options for the CID Recovery Tool	65
Table 17	Cable routing table for the Brocade VDX 8770-8 (48 ports shown)	68
Table 18	General specifications	71
Table 19	System architecture	71
Table 20	System size and weight	72
Table 21	System component weights	72
Table 22	Supported optics	73
Table 23	Power cord types (international)	74
Table 24	NEBS installation requirements for the Brocade VDX 8770-8	77
Table 25	Regulatory compliance standards	81

About This Document

In this chapter

- How this document is organized xiii
- Supported hardware and software. xiv
- What's new in this document xiv
- Document conventions xiv
- Notice to the reader xvi
- Additional information xvi
- Getting technical help xvii
- Document feedback xvii

How this document is organized

This document is a hardware reference manual written for system administrators and technicians experienced with networking and IP technologies to help them install, set up, configure, operate, maintain, and troubleshoot the Brocade VDX 8770-8. It is organized in loosely chronological order, beginning with an overview of the Brocade VDX 8770-8 and ending with removal and replacement procedures of field-replaceable units (FRUs).

The document contains the following sections:

- Chapter 1, "Brocade VDX 8770-8 Overview," identifies the components of the Brocade VDX 8770-8 and provides a brief description of its features.
- Chapter 2, "Installation of the Brocade VDX 8770-8," describes how to install, set up, and power on the Brocade VDX 8770-8.
- Chapter 3, "Logging In and Configuring the Brocade VDX 8770-8," provides the initial configuration information required to get the Brocade VDX 8770-8 up and running.
- Chapter 4, "Monitoring System Components," provides descriptions of the LEDs and their functions, and also lists Network OS commands required for monitoring.
- Chapter 5, "Removal and Replacement Procedures," describes how to remove and replace each of the FRUs in the Brocade VDX 8770-8.
- Appendix A, "Specifications," provides information on the physical characteristics, environmental requirements, and regulatory certifications for the Brocade VDX 8770-8.
- Appendix B, "Caution and Danger Notices," contains a list of the translated Caution and Danger messages.

Supported hardware and software

This document includes information specific to the Brocade VDX 8770-8 running Brocade Network OS version 3.0.0. and later.

What's new in this document

The following changes have been made since this document was last released:

- The NEBS GR-1089 installation requirements were added. *NEBS requirements* on page 77.
- The air filter replacement procedure was added. *Air filter removal and replacement* on page 62.
- Reference to 1Gb transceivers changed to SX (short wavelength) and LX (long wavelength). *Brocade VDX 8770-8 features* on page 1.
- The LED aspects for the management module Ethernet port were changed. *Determining the status of a management module* on page 40.

Document conventions

This section describes text formatting conventions and important notices formats.

Text formatting

The narrative-text formatting conventions that are used in this document are as follows:

bold text	Identifies command names Identifies GUI elements Identifies keywords and operands Identifies text to enter at the GUI or CLI
italic text	Provides emphasis Identifies variables Identifies paths and Internet addresses Identifies document titles
`code` text	Identifies CLI output Identifies syntax examples

In actual examples, command lettercase is often all lowercase. Otherwise, this manual specifically notes those cases in which a command is case-sensitive.

Command syntax conventions

Command syntax in this manual follows these conventions:

command	Commands are printed in bold.
--**option, option**	Command options are printed in bold.
-**argument,** arg	Arguments.
[ ]	Optional element.
variable	Variables are printed in italics. In the help pages, values are underlined or enclosed in angled brackets < >.
...	Repeat the previous element, for example "member[;member...]"
value	Fixed values following arguments are printed in plain font. For example, **show** chassis.
|	Boolean. Elements are exclusive. For example: **show mode** egress | ingress.

Command examples

This book describes how to perform configuration tasks using the Network OS command line interface, but does not describe the commands in detail. For complete descriptions of all Fabric OS commands, including syntax, operand description, and sample output, refer to the *Network OS Command Reference*.

Notes, cautions, and warnings

The following notices and statements are used in this manual. They are listed here in order of increasing severity of potential hazards.

NOTE
A note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates potential damage to hardware or data.

CAUTION

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Notice to the reader

This document may contain references to the trademarks of the following corporations. These trademarks are the properties of their respective companies and corporations.

These references are made for informational purposes only.

Corporation	Referenced Trademarks and Products
Microsoft Corporation	Windows, Windows NT, Internet Explorer
Sun Microsystems, Inc.	Sun, Solaris
Netscape Communications Corporation	Netscape
Red Hat, Inc.	Red Hat, Red Hat Network, Maximum RPM, Linux Undercover
Velcro Industries B.V.	Velcro

Additional information

This section lists additional Brocade and industry-specific documentation that you might find helpful.

Brocade resources

To get up-to-the-minute information, go to *http://my.brocade.com* to register at no cost for a user ID and password.

White papers, online demonstrations, and data sheets are available through the Brocade website at:

http://www.brocade.com/products-solutions/products/index.page

For additional Brocade documentation, visit the Brocade website:

http://www.brocade.com

Release notes are available on the MyBrocade website and are also bundled with the Network OS firmware.

Other industry resources

For additional resource information, visit the Technical Committee T11 website. This website provides interface standards for high-performance and mass storage applications for Fibre Channel, storage management, and other applications:

http://www.t11.org

For information about the Fibre Channel industry, visit the Fibre Channel Industry Association website:

http://www.fibrechannel.org

For information about the Ethernet industry, visit the Internet Engineering Task Force website:

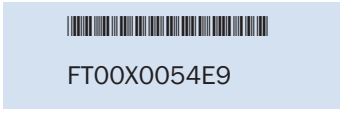
http://www.ietf.org

Getting technical help

Contact your Brocade VDX 8770-8 supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

1. General information
   - Technical Support contract number, if applicable
   - Model name
   - Operating system version
   - Error numbers and messages received
   - **Copy support** command output
   - Detailed description of the problem and specific questions
   - Description of any troubleshooting steps already performed and results
   - Serial console and Telnet session logs
   - Syslog message logs
2. Brocade VDX 8770-8 serial number

   The Brocade VDX 8770-8 serial number (Switch Serial No.) and corresponding bar code are provided on the serial number label, as shown here:

   The serial number label is located on the nonport side of the chassis, on the lower right side and directly below the fans.

   In addition, the **show chassis** command displays the Brocade VDX 8770-8 serial number, as well as information about the line cards and other field-replaceable units (FRUs).
3. License ID/World Wide Name (WWN)

   Use the **show licenseid** command to display the license ID/WWN. The licenseID/WWN is recorded on the chassis identification (CID) cards.

   If you cannot use the **show licenseid** command because the switch is inoperable, you can get the WWN from the same place as the serial number.

Document feedback

Quality is our first concern at Brocade and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to:

documentation@brocade.com

Provide the title and version number of the document and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.

Chapter

Brocade VDX 8770-8 Overview

1

In this chapter

- Brocade VDX 8770-8 features 1
- Brocade VDX 8770-8 hardware components 2
- Brocade VDX 8770-8 line cards 5
- High availability 5
- Software features 5

Brocade VDX 8770-8 features

The Brocade VDX 8770-8 is part of the Brocade Next Generation Data Center Networks product line, a highly robust class of network switching platforms that combines breakthrough performance, scalability, and energy efficiency with long-term investment. These chassis are designed to address the data growth and application demands of evolving enterprise data centers.

The Brocade VDX 8770-8 features the Brocade CloudPlex™ architecture, a fabric-based Ethernet technology that can present virtual desktops over a global network that integrates both static and cloud-based resources.

The Brocade VDX 8770-8 requires Brocade Network Operating System (Network OS) v3.0.0 or greater. For details about Network OS, refer to the *Brocade Network OS Administrator's Guide*.

A key, licensable feature of the Brocade VDX 8770-8 chassis is Brocade VCS® technology, which includes virtual cluster switching, a new set of technologies that allows users to create flatter, virtualized, and highly available data center networks. VCS fabrics are scalable, permitting users to expand at their own pace, and simplified, allowing users to manage the fabric as a single entity. VCS fabrics are convergence-capable, supporting technologies such as iSCSI and NAS as well as Fibre Channel over Ethernet (FCoE) (licensable) for storage.

Key features of the Brocade VDX 8770-8 include:

- Up to 384 10 GbE or 1 GbE external ports or 96 40 GbE external ports in line card modules
- Dual, redundant management modules (MM)
- Up to six switch fabric modules (SFM)
- Up to eight redundant, hot-swappable power supplies at 220 VAC or -48 VDC
- Up to four hot-swappable fan assemblies
- Serial (console), Ethernet, and USB connections for management modules

NOTE
USB support is for Brocade-branded USB devices only

- Support for short wavelength (SX) and long wavelength (LX) 1 Gbps SFP transceivers

- Support for SR and LR 10 Gbps SFP+ transceivers
- Support for 40 Gbps QSFP transceivers
- Support for active twinaxial (twinax) cable at 1, 3, and 5 meters for 10 GbE ports
- NEBS-compliant chassis (certification in process)
- Support for in-band management
- 15U form factor for chassis
- Support for Brocade trunking through the 48x10G line card module (maximum of eight ports per trunk)
- Support for Fibre Channel over Ethernet (FCoE)

Brocade VDX 8770-8 hardware components

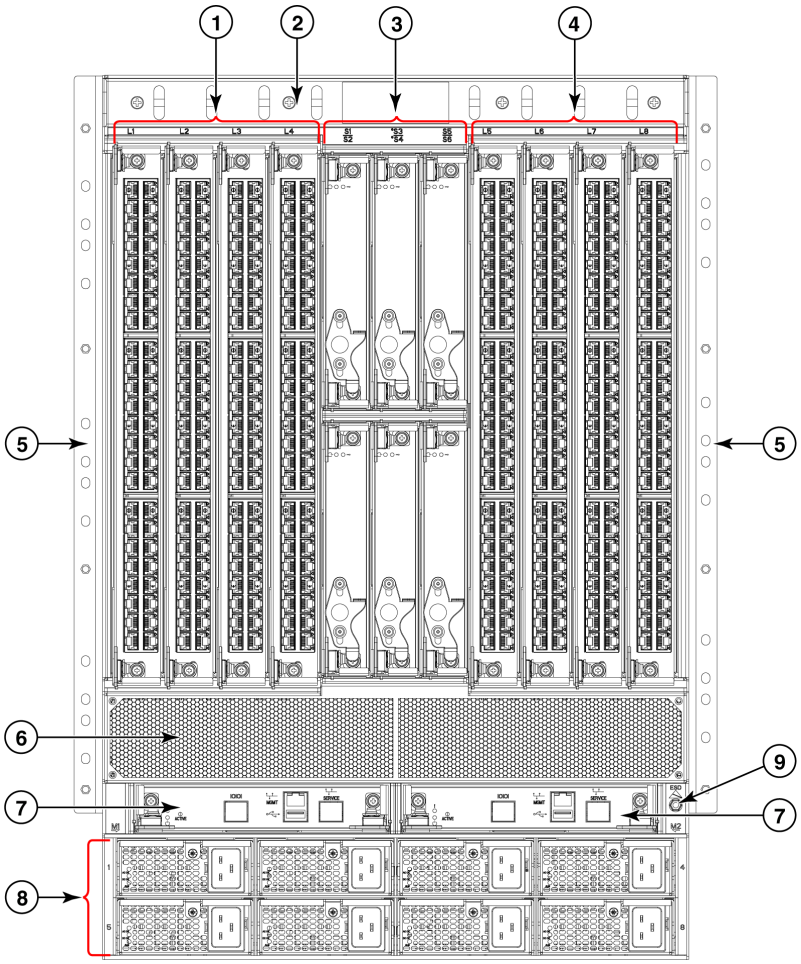
The Brocade VDX 8770-8 features a modular and scalable mechanical construction that allows a wide range of flexibility in installation, fabric design, and maintenance. The minimum chassis configuration is one MM, one SFM, and one line card. The chassis can be mounted with the cables facing the front of the equipment rack and consists of the following components:

- Eight slots for hot-swappable line cards that can be configured in a single chassis, delivering up to 384 10 Gbps or 1 Gbps Ethernet (GbE) ports or 96 40 Gbps Ethernet ports.
- Two slots for management modules:
  - A single active management module can control all ports in the chassis.
  - The standby management module takes control of the Brocade VDX 8770-8 if the active management module fails.
- six slots for switch fabric modules that interconnect all line cards.
- Modular, hot-swappable field-replaceable units (FRUs):
  - 48x10GbE line card
  - 48x1GbE line card
  - 12x40GbE line card
  - Four fan assemblies
  - Up to eight 3000W power supplies, 200–240 VAC auto-sensing or -48 VDC (each power supply connection should be separately fused)
  - The 48x10GbE line cards support 10 GbE SFP+ and 1 GbE SFP optical transceivers, as well as 1 GbE copper SFP transceivers. They also support direct-attach 10 GbE copper twinax cables at 1, 3, or 5 meters.
  - The 12x40GbE line card supports 40 GbE QSFP optical transceivers.
- Cable management comb

Port side of the Brocade VDX 8770-8

NOTE
Airflow in the Brocade VDX 8770-8 is from the port side to the rear (fan side) of the chassis.

Figure 1 displays a sample configuration of the port side of the Brocade VDX 8770-8.

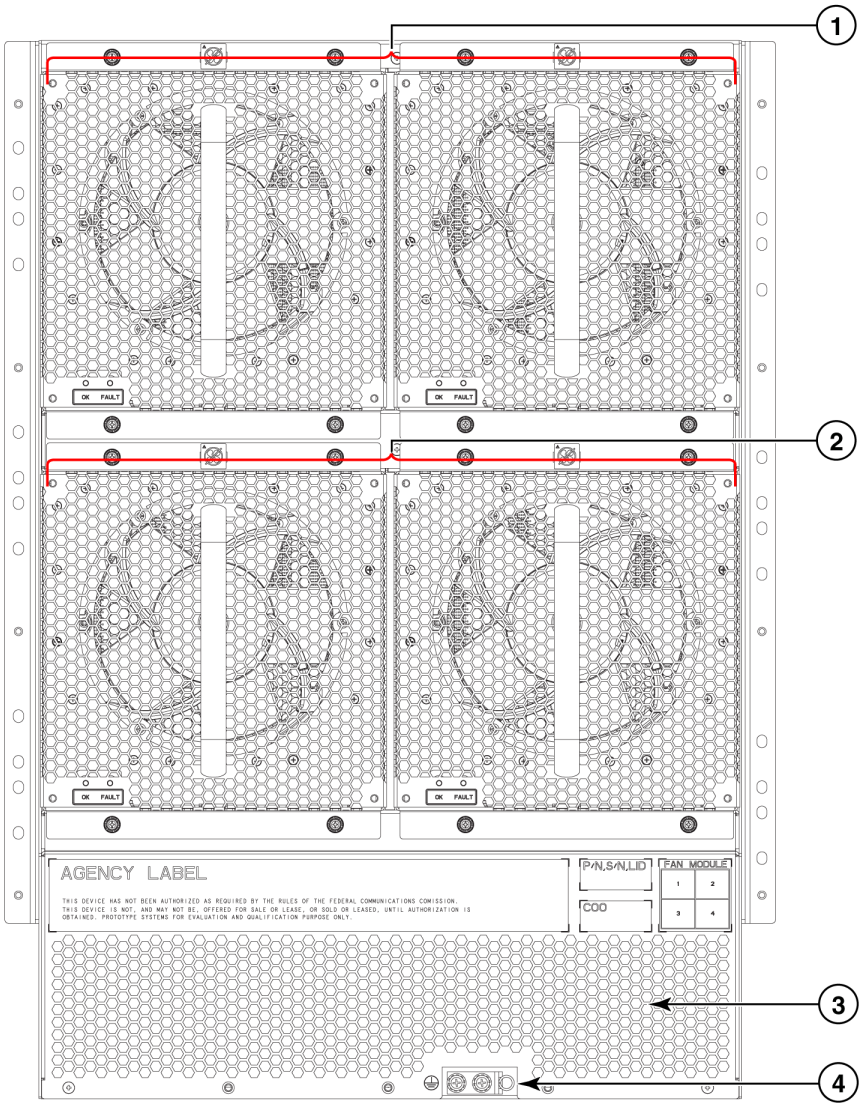


1 Line cards L1 through L4 (left to right)
2 Cable management comb
3 Switch fabric modules S1 through S6 (odd numbers above, even numbers below, left to right)
4 Line cards L5 through L8 (left to right)
5 Mounting flanges
6 Intake Vent
7 Management modules MM1 and MM2 (left to right)
8 Power supplies 1 through 8 (1 through 4 above, left to right, 5 through 8 below, left to right))
9 ESD jack

FIGURE 1 Port side of the Brocade VDX 8770-8 (sample configuration)

Nonport side of the Brocade VDX 8770-8

Figure 2 shows a sample configuration of the nonport side view of the Brocade VDX 8770-8.



1	Fan assemblies 1 and 2 (left to right)	3	Power supply exhaust vent
2	Fan assemblies 3 and 4 (left to right)	4	Ground lug

FIGURE 2 Nonport side of the Brocade VDX 8770-8 (sample configuration)

Brocade VDX 8770-8 line cards

Table 1 summarizes the line cards that are available for the Brocade VDX 8770-8.

TABLE 1 Line cards available for the Brocade VDX 8770-8

Line card	Description
12x40 GbE	12 40 Gbps QSFP Ethernet ports.
48x10 GbE	48 1/10 Gbps Ethernet ports.
48x1 GbE	48 1 Gbps Ethernet ports.

High availability

High availability is currently limited to management module configuration synchronization. Failover to the standby module will occur in case of active module failure, but the standby module will go through a cold recovery in which all system components are reset. This will disrupt traffic on the chassis. The reset could take up to eight minutes depending on chassis configuration and traffic load.

Software features

The following is a partial list of the features supported in the software. See the *Brocade Network OS Administrator's Guide* for details on software and supported features.

Layer 2

- L2 data forwarding
- MAC learning and aging
- Brocade Trunking
- Priority Flow Control (PFC)
- Enhanced Transmission Selection (ETS)
- Terminal Access Controller Access-Control System Plus (TACACS+)
- Link Aggregation Control Protocol (LACP)
- Link Layer Discovery Protocol/ Data Center Bridging eXchange (LLDP/DCBX)
- 802.1x
- Brocade Link Discovery Protocol (BLDP)

Layer 3

- Open Shortest Path First (OSPF) v2
- Static routes
- Virtual Router Redundancy Protocol (VRRP and VRRP-E)

- Internet Group Management Protocol (IGMP) v1 and v2 and snooping
- Address Resolution Protocol (ARP)

Virtualization

- Automatic Migration of Port Profiles (AMPP)
- Support for VLAN, QoS, security, and FCoE port profiles
- VMware vCenter and Brocade NOS integration

FCoE

- Pause Frames (Tx and Rx)
- Priority Flow Control (PFC)
- Enhanced Transmission Selection (ETS)
- End-to-end, multi-hop FCoE (with proper licensing)
- FCoE and FC zoning and RSCN suppression (name server-based zoning)
- FIP version 1
- FC Fabric Services for FCoE VN-port devices
- Multipath support for FCoE traffic
- FCoE over standard LAGs
- Soft zoning support

Link aggregration

- 802.3ad LACP support
- Virtual Link Aggregation Group (vLAG – a LAG that spans multiple physical switches)

QoS

- 802.1p marking
- Scheduling: Strict priority (SP), Shaped Deficit Weighted Round-Robin (SDWRR)
- CEE provisioning and classification
- Rewrite/marking, queuing
- Congestion control
- Multicast rate limit scheduling
- Port-based SPAN
- Layer 2 and Layer 3 ACLs (ingress and egress)
- Port-based sFLOW

Management

- IPv4 or IPv6 management

- CLI management utilities on Network OS v3.0.0
- sFlow
- TRILL Operations, Administration, and Management (OAM)
- Distributed configuration management (DCMd)

Licensing

- VCS licensing: available multi-node license for more than two nodes enables VCS fabric functionality
- FCoE licensing: enables FCoE feature set
- Layer 3 licensing: enables IPv4 routing protocols (OSPF), , VRRP, VRRP-E

1 Software features

Chapter

2

Installation of the Brocade VDX 8770-8

In this chapter

- Time and items required 9
- Items included with the Brocade VDX 8770-8. 10
- Preparing for the Brocade VDX 8770-8 installation 12
- Unpacking and installing the Brocade VDX 8770-8 16
- Port numbering 17
- Providing power to the Brocade VDX 8770-8. 18

Time and items required

You can set up and install the Brocade VDX 8770-8 in the following ways:

- As a standalone unit on a flat surface
- In a four-post rack
- In a two-post telecommunications (Telco) rack

This manual describes how to set up the Brocade VDX 8770-8 as a standalone unit. For rack mount installation instructions, refer to the manual that comes with the separately ordered rack kit.

Table 2 describes the main installation and setup tasks, the estimated time required for each, and the items required to complete the task based on a fully populated Brocade VDX 8770-8 (384 10 GbE ports). Configurations with fewer ports require less time. These time estimates assume a prepared installation site and appropriate power and network connectivity.

DANGER

The procedures in this manual are for qualified service personnel.

TABLE 2 Installation tasks, time, and items required

Installation task	Time estimate	Items required
Site preparation and unpacking Brocade VDX 8770-8	30 minutes	#2 Phillips screwdriver. Pallet jack. Hydraulic lift or assisted lift, able to raise to a *minimum* of 140 cm (55 in.), with a *minimum* capacity of 113 kg (250 lb). A fully loaded version of the Brocade VDX 8770-8 weighs 165.56 kg (365 lbs).

TABLE 2 Installation tasks, time, and items required (Continued)

Installation task	Time estimate	Items required
Installing the rack mount kit	30 minutes	Refer to the proper rack mount kit instructions for your specific rack..
Mounting and securing Brocade VDX 8770-8 in the rack	30 minutes	
Inserting modules and power supplies	5-10 minutes per unit	Management modules, switch fabric modules, line cards, power supplies (AC or DC).
Installing power cables and powering on the Brocade VDX 8770-8	20 minutes	Power cables (provided in the Brocade VDX 8770-8 accessory kit).
Establishing a serial connection, logging on to the Brocade VDX 8770-8, and configuring the IP addresses	20 minutes	Serial cable (also called the console cable - provided in the accessory kit). Workstation computer with a serial (console) port or terminal server port and a terminal emulator application (such as HyperTerminal). Ethernet IP addresses for the Brocade VDX 8770-8 switch and for management modules: total two or three addresses, depending on the number of management modules installed.
Installing an Ethernet cable, opening a Telnet session, and configuring the Brocade VDX 8770-8 date and time and additional system parameters. Verify and back up configuration.	20 minutes	Ethernet cabling (optional) for Telnet access. Refer to the *Brocade Network OS Administrator's Guide*.
Installing transceivers as needed	30-60 minutes (up to 30 seconds per transceiver)	Copper and optical transceivers and direct-attach cables as needed.
Attaching cables, cable ties, and cable guides	2-3 hours	Cables, cable ties, and cable comb.

CAUTION

The Brocade VDX 8770-8 with DC power sources are intended for installation in restricted access areas only. A restricted access area is a location where access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.

CAUTION

The Brocade VDX 8770-8 with AC power sources are intended for installation in restricted access areas only. A restricted access area is a location where access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security.

Items included with the Brocade VDX 8770-8

The basic Brocade VDX 8770-8 (SKUs BR-VDX8770-8-BND-AC or BR-VDX8770-8-BND-DC depending on whether you order AC or DC power supplies) ships with the following items:

- Brocade VDX 8770-8 chassis, populated with:
  - Management modules (one)
  - Switch fabric modules (six)
  - Filler panels for unoccupied slots for all modules
  - Power supplies (up to three)
  - Power supply filler panels for unoccupied bays
  - Fan assemblies (four)
- Accessory kit containing the following items:
  - Console cable (RS-45 serial cable: There is also an adapter that can be used to provide an DB9-style connector.)
  - Wrist strap (ESD grounding strap)
  - Ground lug kit
  - SFP extraction tool kit
  - China RoHS guide
  - Cable management comb
  - Brocade-branded USB device
  - Power cord retainer kit
  - *Brocade VDX 8770-8 QuickStart Guide* (this publication)
  - Hardware for securing the switch in a rack
  - Web pointer document
  - Air filter

Line cards (up to 8)and additional power supplies must be ordered separately.

The rack mount kits must be ordered separately.

Brocade-branded transceivers (SFP, SFP+, or QSFP) and cables or direct-attach cables must also be ordered separately. The Brocade VDX 8770-8 supports SR and LR SFP and SFP+ transceivers. The QSFP transceivers are SR transceivers only.

NOTE
For information about the transceivers that are qualified for the Brocade VDX 8770-8, refer to http://www.brocade.com/downloads/documents/matrices/Brocade_Compatibility_Matrix.pdf.

Preparing for the Brocade VDX 8770-8 installation

NOTE
Refer to the safety notices before installation ("Safety notices").
Refer to "NEBS requirements" to ensure compliance with NEBS-GR-1089 standards.
Refer to "Power specifications" to plan for meeting power supply standards before installing the chassis.
Refer to "Environmental requirements" to plan for your environmental needs.
Refer to "Managing cables" to plan for cable management.

DANGER

The procedures in this manual are for qualified service personnel.

The following steps are required to ensure correct installation and operation.

1. Provide a space that is 15 rack units (15U) high, 61.29 cm (24.09 in.) deep, and 43.74 cm (17.22 in.) wide. One rack unit is equal to 4.45 cm (1.75 in.).

   Plan to install the Brocade VDX 8770-8 with the port side facing the air-intake aisle. Airflow is from the port side of the switch to the fan side.

   Ensure that the rack is balanced and mechanically secured to provide stability in the event of an earthquake and that the equipment does not exceed the rack's weight limits.

   NOTE
   Doorways must be wider than 91 cm (36 in.) to accommodate the switch.

2. Ensure that dedicated electrical branch circuits with the following characteristics are available:
   - Up to eight dedicated fused 200–240 VAC, 50–60 Hz feeds or -48 VDC (one per power supply)
   - One cable for each power supply

CAUTION

Use a separate branch circuit for each AC power cord for redundancy in case one of the circuits fails.

   - Protected by a circuit breaker in accordance with local electrical codes
   - Supply circuit, line fusing, and wire size adequate to the electrical rating on the switch nameplate
   - Location close to the switch and easily accessible

- Grounded outlets installed by a licensed electrician and compatible with the power cords

DANGER

If the installation requires a different power cord than the one supplied with the switch, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch.

3. Plan for cable management before installing the switch.

   Cables can be managed in a variety of ways, such as by routing cables below the switch, to either side of the switch, through cable channels on the sides of the rack, or by using patch panels.

4. Ensure that the following items are available for configuration of the Brocade VDX 8770-8:
   - Workstation with an installed terminal emulator, such as HyperTerminal
   - Console (serial) cable (provided)
   - Ethernet cables (not provided)
   - Either access to an FTP server or a Brocade USB device for backing up the switch configuration or collecting **supportsave** output data (optional)
   - Transceivers (copper and optical) and compatible cables and direct-attach cables if needed
5. Brocade strongly recommends that devices be installed in environments that have minimal dust and airborne contaminants.
6. Ensure that the air intake and exhaust vents have a minimum of 5.1 cm (2 in.) of airspace.
7. Ensure that the air temperature on the air intake side is less than 40°C (104°F) during operation.

Power specifications

Power for the Brocade VDX 8770-8 can be supplied with either AC- or DC-based 3000 watt power supplies. The Brocade VDX 8770-8 has room for up to eight power supplies.

Table 3 shows the basic power specifications for each power supply.

TABLE 3 Power specifications

Specification	Value for 3000W AC power supply	Value for 3000W DC power supply
Input rating	16A	70A
Input voltage	200–240 VAC, 50-60 Hz, 16.0 Amp maximum	-48 VDC
Operating range	180 ot 264 VAC	-40 to -60 VDC

TABLE 3 Power specifications (Continued)

Specification	Value for 3000W AC power supply	Value for 3000W DC power supply
Inrush current	Limited to 60 Amp peak for any initial current surge or spike of 10 ms or less at either cold or warm start. Any additional inrush current surges or spikes in the form of AC cycles or multiple AC cycles greater than 10 ms and less than 150 ms, must not exceed 25 Amp peak.	Limited to 70 Amp peak for any initial current surge or spike of 10 ms or less at either cold or warm start.
Output	12 VDC, 245 Amps	12 VDC, 245 Amps

CAUTION

For the DC input circuit to the system of a Brocade VDX 8770-8 (3000W power supply), make sure there is an 80 Amp circuit breaker, minimum -48 VDC, double pole, on the input lugs to the power supply. The input wiring for the connection to the switch should be copper wire, 2 American Wire Guage (AWG), marked VW-1, and rated minimum 90°C.

The power requirements for a given switch configuration depend on which modules have been installed in the switch. Table 4 shows the power consumption for the modules that can be used in the Brocade VDX 8770-8 switch along with the power consumption for the cooling fans.

All numbers for the line cards assume that the card is fully populated with optical transceivers, including QSFPs for the 12x40 GbE line cards. All ports are Ethernet.

You can calculate your power requirements by combining the power demands for the various modules and fan units in your configuration. While you may use fewer ports in a given line card, it is always safer to use the power requirement of a fully populated card.

TABLE 4 Power demands per component

Module or fan units	Power demand at idle - blades enabled, no optics, ports disabled (Watts)	Nominal power demand - blades enabled, optics, 50% line rate, random packets (Watts)	Maximum power demand - blades enabled, optics, traffic present, full line rate, 64 byte smallest packet, 40°C ambient temp., maximum power for all supported optics (Watts)
Management module	46	46	50
Switch fabric module	120	120	132
48x1G line card	245	310	460
48x10G line card	245	310	460
12x40G line card	247	290	440
Fan unit	25	25	268

CAUTION

For the NEBS-compliant installation of a Brocade VDX 8770-8 with AC or DC systems, use a ground wire of at least 2 AWG. The ground wire should have an agency-approved crimped connector (provided with the device) attached to one end, with the other end attached to building ground. The connector must be crimped with the proper tool, allowing it to be connected to both ground screws on the enclosure. Before crimping the ground wire into the provided ground lug,

ensure that the bare copper wire has been cleaned and antioxidant is applied to the bare wire. In addition, anti-rotation devices or lock washers must be used with all screw connections for the grounding wire.

Environmental requirements

DANGER

Do not install the router in an environment where the operating ambient temperature might exceed 40 °C (104 °F).

Table 5 lists the environmental operating ranges for the Brocade VDX 8770-8. The requirements for non-operating conditions are also provided for acceptable storage and transportation environments.

TABLE 5 Environmental requirements

Condition	Acceptable range during operation	Acceptable range during non-operation
Ambient temperature	0° to 40° C (32° to 104° F) outside switch	-25° to +70° C (-13° to 158° F) outside switch
Humidity	5% to 90% RH noncondensing, at 40° C (104° F), with maximum gradient of 10% per hour	10% to 90% RH noncondensing, at 70° C (158° F)
Altitude	0 to 3 km (10,000 ft.) above sea level	0 to 12 km (40,000 ft.) above sea level
Shock	20G, 6 ms duration, half-sine wave	33G, 11 ms duration, half-sine wave
Vibration	0.5G p-p, 5-500 Hz at 1.0 octave/minute	2.0G p-p, 5-500 Hz at 1.0 octave/minute
Airflow	Maximum: 1250 cu ft/min. (2124 cu m/hr) Nominal: 325 cu ft/min. (552 cu m/hr	None required
Maximum heat dissipation	Up to 11500W or 39,250 BTU/hr	Not applicable

NOTE

The 0° to 40° C (32° to 104° F) range applies to the ambient air temperature at the air intake vents on the port side of the Brocade VDX 8770-8.

The temperature inside the Brocade VDX 8770-8 can be up to 90° C (194° F) for some modules during operation. Brocade recommends that the internal tempertaure not exceed 75° C (167° F). Cooling policy is based on a combination of ambient temperature and measured temperature on the modules. Various combinations will result in an increase in fan speed to create more cooling in the switch.

If a component approaches a critical temperature that will trigger a module shutdown, there will be a WARNING message in the raslog, followed by a CRITICAL message saying that the module will shut down in two minutes.

Use the **show environment** command to view temperature status.

Chassis slots

Switch slots are coded and numbered to differentiate between management module slots, switch fabric module slots, and line card slots. Management modules (MM) must be installed only in slots M1 and M2. Switch fabric modules (SFM) must be installed only in slots S1 through S6. There must be at least one SFM installed in either slot S3 or slot S4. The line card slots, L1 through L8, can be filled with either 48x1G, 48x10G, or 12x40G line cards. Unused slots must be filled with the correct filler panels to maintain adequate cooling.

Unpacking and installing the Brocade VDX 8770-8

Use the following procedure to unpack and install your Brocade VDX 8770-8.

CAUTION

Use safe lifting practices when moving the product. (C015)

NOTE

A fully populated Brocade VDX 8770-8 weighs approximately 165.56 kg (365 lb) and requires a hydraulic or assisted lift to install it.

1. Unpack the Brocade VDX 8770-8.
   a. Cut the bands that encircle the packaging.
   b. Slide the upper portion of the cardboard shipping box up off the pallet and shipping tray.

   NOTE

   The Brocade VDX 8770-8 packaging incorporates a wood pallet and brackets. The switch sits on top of a corrugated cardboard shipping tray.

   c. Save the packing materials for use when returning a switch.
   d. Leave the switch on top of the shipping tray and pallet if the switch must be transported to the installation location.
2. Use a pallet jack or other assisted lift to transport the new switch to the installation area.
3. Using the rack mount instructions, install the rack components in the rack and mounting flanges on the switch. The rack mount kit and instructions are shipped separately from the switch.
4. Remove the accessory kit (cardboard box), packing foam, and antistatic plastic from the switch and set them aside.
5. Remove the foam inserts around the base of the switch.
6. Use a lift to raise the switch to the correct level. If installing the switch in a rack, follow the instructions provided by the rack kit manufacturer.
7. If applicable, lock the wheels of the lift.
8. Ensure that the switch is oriented so that the port side (front) has access to intake air.

9. Gently slide the switch onto the final installation surface, ensuring that it remains supported during the transfer.
10. Before you apply power to the switch, you can install the MM, SFM, and line card modules as well as power supplies to speed up your installation.

Port numbering

The Brocade VDX 8770-8 uses the following port numbering method:

- 12x40G line card module — Ports are numbered from 1 through 12 from from top to bottom when installed in the switch. Refer to Figure 3.

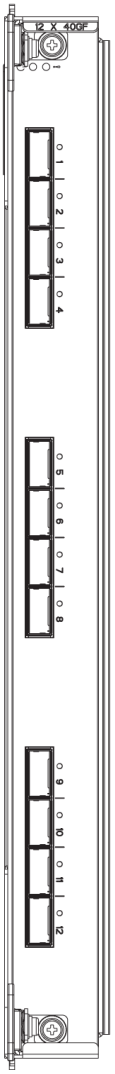


FIGURE 3 12x40G line card

- 48x1G and 48x10G line card modules — Ports are numbered from 1 through 48, from top to bottom, with the odd-numbered ports on the right row and the even-numbered ports on the left row when installed in the switch. Refer to Figure 4.

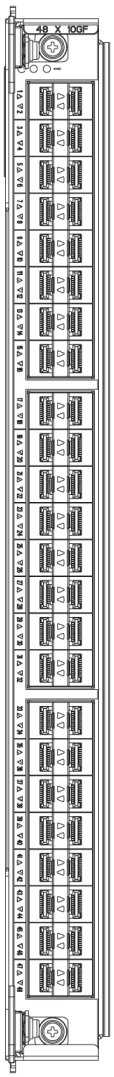


FIGURE 4 48x10G line card (48x1G line card similar)

Providing power to the Brocade VDX 8770-8

Complete the following steps to provide power to the chassis. Each power supply has one power cord.

DANGER

Use the supplied power cords. Ensure the facility power receptacle is the correct type, supplies the required voltage, and is properly grounded. (D004)

Connecting an AC power cord

1. Plug the power cord into the power supply.
2. Route the cable so it will be out of the way when connected to the power source.
3. Plug the other end of the cable into the power source.

Connecting a DC power cord

1. Use a #1 Phillips screwdriver to remove the screw that secures the safety cover over the power lugs and remove the safety cover.
2. Use a #2 Phillips screwdriver to unscrew the power lugs.
3. Crimp the #2 AWG power supply wires into the power lugs.
4. Connect the power lugs to the power supply unit.

   Connect the -48V wire to the negative terminal and the 0V wire to the positive terminal.

   NOTE
   The DC return must be isolated from the chassis ground (DC-I) when making connections to the connections to the power supply.

5. Replace the safety cover.
6. Plug the other end of the cable into the power source.

   ATTENTION
   Do not connect the switch to the network until the IP addresses are configured.

   For information about LED patterns, see Chapter 4, “Monitoring System Components”.

Chapter

Logging In and Configuring the Brocade VDX 8770-8 3

In this chapter

- Preparing to configure the Brocade VDX 8770-8 21
- Establishing a serial connection to the Brocade VDX 8770-8 22
- Logging in to the serial console port 24
- Changing the RBridge ID 24
- Assigning permanent passwords 24
- Configuring the IP addresses 25
- Logging off the serial console port and disconnecting the serial cable . . . 26
- Establishing an Ethernet connection to the Brocade VDX 8770-8 26
- Customizing a host name 27
- Customizing a chassis name 27
- Setting the date and time 28
- Determining installed software licenses 30
- Saving your changes 30
- Verifying correct operation 31
- Backing up the configuration 31
- Connecting network devices 32
- Installing transceivers and attaching cables 32
- Managing cables 34
- Creating Brocade inter-switch link trunks 34

Preparing to configure the Brocade VDX 8770-8

The Brocade VDX 8770-8 must be configured before it is connected to the fabric, and all of the configuration commands must be entered through the active MM. The Brocade VDX 8770-8 configuration includes the following parameters:

- RBridge ID, If you are going to have more than one switch in a fabric.
- IP address and gateway address for the switch
- IP addresses, host names, and gateway addresses for one or two MMs, as needed
- Host name

You also need to change passwords from their default values and set the time and date, either via NTP or manually.

In order to retain the changes made during configuration you will have to copy the running configuration file to the startup configuration file. This will ensure that the switch reboots to your preferred configuration.

The configuration information is mirrored to the standby MM, if you have installed one, which allows the current configuration to remain available even if the active MM fails. The configuration information for the Brocade VDX 8770-8 is stored in the CID cards and the flash memory of the MMs. The configuration can be backed up to a workstation (uploaded) and then downloaded to the active MM if necessary.

By default, the Product Name is in VCS™ mode. It cannot be configured in standalone mode. Without a VCS license, the switch can be part of a two-node cluster where two switches are connected in VCS mode to form an Ethernet fabric. To be part of a larger cluster, you must install a VCS license.

In VCS mode, the switch is part of an VCS fabric involving two or more VCS-enabled switches. VCS technology embodies the concept of distributed intelligence. Distributed intelligence means that all configuration and destination information is automatically distributed to each member switch in the fabric. Distributed intelligence has three major characteristics:

- The fabric is self-forming. When two or more VCS-enabled switches with unique Rbridge IDs are connected to form an VCS fabric, the fabric is automatically created and the switches discover the common fabric configuration.
- The fabric is masterless. No single switch stores configuration information or controls fabric operations. Any switch can fail or be removed without causing disruptive fabric downtime or delayed traffic.
- The fabric is aware of all members, devices, and Virtual Machines (VMs). Automatic Migration of Port Profiles (AMPP) supports VM migration to another physical server. If the VM moves, it is automatically reconnected to all of its original resources.

Establishing a serial connection to the Brocade VDX 8770-8

The serial port is located on the port side of the Brocade VDX 8770-8. The switch uses an RJ-45 connector for the serial port. An RJ-45 to DB9 adapter is also provided with the Brocade VDX 8770-8. The cable supplied with the switch is a rollover cable. The serial port is used to connect to a workstation to configure the Brocade VDX 8770-8 IP address before connecting the switch to a fabric or IP network.

NOTE
To protect the serial port from damage, keep the cover on the port when not in use.

To establish a serial connection to the serial (console) port on the Brocade VDX 8770-8, complete the following steps.

1. Verify that the Brocade VDX 8770-8 is powered on and that POST is complete by verifying that all power LED indicators on the management, switch fabric, and line card modules display a steady green light.
2. Remove the shipping cap from the serial port (labeled **IOIOI**) on the active MM.
   By default, the MM installed in slot M1 is the active MM unless an error occurs. The active MM is also indicated by an illuminated blue LED labeled **ACTIVE**.
3. Use the serial cable provided with the Brocade VDX 8770-8 to connect the serial port on the active MM to a computer workstation.

If the serial port on the workstation or terminal device is DB9 instead of RJ-45, remove the adapter on the end of the serial cable and insert the exposed DB9 connector into the DB9 serial port on the workstation.

ATTENTION
The serial port is intended primarily for the initial setting of the IP address and for service purposes.

4. Disable any serial communication programs running on the workstation (such as synchronization programs).
5. Open a terminal emulator application (such as HyperTerminal on a PC, or TERM, TIP, or Kermit in a UNIX environment), and configure the application as follows:
   - In a Windows environment, use the following parameters:

TABLE 6 Windows serial connection parameters

Parameter	Value
Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

   - In a UNIX environment, enter the following string at the prompt:

```
tip /dev/ttyb -9600
```

     If ttyb is already in use, use ttya instead and enter the following string at the prompt:

```
tip /dev/ttya -9600
```

Table 7 lists the serial cable pinouts.

TABLE 7 Serial cable pinouts

PIN	Signal	Description
1	Not supported	NA
2	Not supported	NA
3	TXD	Transmit data
4	GND	Logic ground
5	Not supported	NA
6	RXD	Receive data
7	Not supported	NA
8	Not supported	NA

Logging in to the serial console port

Log in to the Brocade VDX 8770-8 through the serial connection with the **admin** user name. The default password is **password**. While you are not required to change the password at the initial login, Brocade recommends that you change your admin and user passwords. Refer to "Assigning permanent passwords" for more details. Make sure to write down the new passwords and keep this information in a secure location.

```
Network OS (8770HOST)

8770HOST console login: admin
Password:

WARNING: The default password of 'admin' and 'user' accounts have not been
changed.

Welcome to the Brocade Network Operating System Software
admin connected from 127.0.0.1 using console on 8770HOST
8770HOST#
```

Changing the RBridge ID

If you are going to have more than one switch in a fabric, each switch must have a unique RBridge ID. The default RBridge ID for any Brocade VDX 8770-8 is 1. Use the **vcs rbridge-id** *[rbridge-id]* command to change the default RBridge ID. You should be in privileged EXEC mode to run the command.

Enter the **vcs rbridge-id** *[rbridge-id]* command.

```
switch# vcs rbridge-id 2
This operation will change the configuration to default and reboot the switch.
Do you want to continue? [y/n]:y
```

When the confirmation question appears, answer Y.

The reply to command will include a line about the setting of the RBridge ID.

```
Successfully set rbridge-id.
```

Assigning permanent passwords

The factory-configured default accounts on the switch are admin and user. Use the default administrative account as shown in Table 8 to log in to the switch for the first time and to perform the basic configuration tasks. The user account is read-only and used primarily for system monitoring.

TABLE 8 Default administrative account names and passwords

Account type	Login name	Password
Administrative	admin	password
User account (read-only)	user	password

Changing the default account passwords

When you change the default account password after you log in for the first time, only the default password rule is in effect. The rule specifies a minimum password length of eight characters. For advanced user and role management, including setting password rules, refer to the Security chapter of the *Brocade Network OS Administrator's Guide*.

NOTE
Passwords can be 8 to 40 characters long. They must begin with an alphabetic character. They can include numeric characters, the period (.), and the underscore (_) only. Passwords are case-sensitive, and they are not displayed when you enter them on the command line. The available roles are **admin** and **user**. For more information on passwords, refer to the *Brocade Network OS Administrator's Guide*.

1. Enter the **configure terminal** command to enter global configuration mode.
2. Enter the **username** command followed by the account name and the password parameter.
3. When prompted, enter the new password. and press **Enter**.

```
Switch# configure terminal
Entering configuration mode terminal
switch(config)# username admin password [new-password]
(<WORD>;;User password satisfying password-attributes):********
```

Configuring the IP addresses

You can configure the Product Name with a static IP address. DHCP is not supported on the Product Name. The Product Name supports both IPv4 and IPv6 format addresses.

Setting a static IP address

Complete the following steps to set a static IP address.

1. Log in to the MM using the default password (the default password is *password*).
2. Enter configuration mode using the **configure terminal** command.
3. Specify the chassis with the **rbridge-id** command.

   ```
   switch(config)# rbridge-id 1
   ```

4. Use the **chassis virtual-ip** command to set the IP address for the chassis.

   ```
   switch(config-rbridge-id 1)# chassis virtual-ip 10.20.236.132/20
   ```

5. Use the **ip address** command to set the Ethernet IP address for the MMs.

   If you are going to use an IPv4 IP address, enter the IP address in dotted decimal notation. You should also disable DHCP and enter a gateway address as well.

   When you have assigned the IP and gateway addresses to management interface 1/1, you should also assgin IP and gateway addresses to management interface 1/2 if you have installed a second MM.

   ```
   switch(config)# interface Management 1/1
   ```

```
switch(config-Management-1/1)# no ip address dhcp
switch(config-Management-1/1)# ip address 10.24.85.81/20
switch(config-Management-1/1)# ip gateway-address 10.24.80.1
```

ATTENTION
The ip gateway-address command will not be available on the Brocade VDX 8770-8 if the L3 or Advanced license is installed. In that case, use the following command sequence:

```
switch(config)# rbridge-id 1
switch(config-rbridge-id 1)# ip route 0.0.0.0/0 <default-gateway>
```

If you are going to use an IPv6 address, enter the network information in semicolon-separated notation as prompted after the **ipv6 address** operand. You should also disable DHCP.

```
switch(config)# interface Management 1/1
switch(config-Management-1/1)# no ip address dhcp
switch(config-Management-1/1)# ipv6 address \
fd00:60:69bc:832:e61f:13ff:fe67:4b94/64
```

6. To display the configuration, use the **show running-config interface Management** command.

```
switch# show running-config interface Management 1/1
interface Management 1/1
 no ip address dhcp
 ip address 10.24.85.81/20
 ip gateway-address 10.24.80.1
 ipv6 address fd00:60:69bc:832:e61f:13ff:fe67:4b94/64
 no ipv6 address autoconfig
!
```

Logging off the serial console port and disconnecting the serial cable

You can use the serial port to monitor error messages through the serial connection. If the serial port is no longer required, use the **logout** command to log out of the serial console, remove the serial cable, and replace the protective plug in the serial port.

Establishing an Ethernet connection to the Brocade VDX 8770-8

After using a serial connection to configure the IP addresses for the Brocade VDX 8770-8, you can connect the active MM to the local area network (LAN).

NOTE
Connecting the MMs to a private network is recommended.

By establishing an Ethernet connection, you can complete the Brocade VDX 8770-8 configuration using a serial session, Telnet, or management application, such as Brocade Network Advisor.

NOTE
To protect the Ethernet port from damage, keep the cover on the port when not in use.

Perform the following steps to establish an Ethernet connection to the Brocade VDX 8770-8.

1. Remove the shipping plug from the Ethernet port on the active MM.
2. Insert one end of an Ethernet cable into the Ethernet port.

3. Connect the other end to an Ethernet 10/100/1000 BaseT LAN.

   The Brocade VDX 8770-8 can be accessed through a remote connection using the command line by way of Telnet or any of the management tools, such as Brocade Network Advisor.

4. To complete any additional Brocade VDX 8770-8 configuration procedures through a Telnet session, log in to the Brocade VDX 8770-8 by Telnet using the **admin** login. The default password is **password**.

Customizing a host name

This procedure is optional.

While still in Telnet you can change the host (switch) name of the switch. The host name of the Brocade VDX 8770-8 can be up to 30 characters long using Network OS release 3.0.0 or later, can include letters, numbers, hyphens, and underscore characters, and must begin with a letter. The default host name is “sw0.” The host name is displayed at the system prompt.

1. Enter **switch-attributes** followed by the Rbridge ID and the **host-name** operand with the new name.

   If you have changed the Rbridge ID, be sure to use that ID.

   ```
   switch(config)# switch-attributes 1 host-name rack1_8770_8
   ```

2. Record the new name for reference.
3. To verify the new host name you can run the **show running-config** command in EXEC mode.

   ```
   switch# show running-config
   ```

Customizing a chassis name

This procedure is optional.

While still in Telnet you can change the chassis name of the switch. The chassis name of the Brocade VDX 8770-8 can be up to 30 characters long; can include letters, numbers, hyphens, and underscore characters; and must begin with a letter. The default chassis name is “VDX8770-8.”

Brocade recommends that you customize the chassis name for each platform because some of the system logs refer to the platorm by its chassis name.

1. Enter **switch-attributes** followed by the Rbridge ID and the **chassis-name** operand with the new chassis name.

   If you have changed the rbridge-ID, be sure to use that ID.

   ```
   switch(config)# switch-attributes 1 chassis-name B8770_prime
   ```

2. Record the new name for reference.
3. To verify the new chassis name you can run the **show running-config switch-attributes** [*rbridge-id*] command.

   ```
   switch# show running-config switch-attributes 1
   ```

Setting the date and time

The MM maintains the current date and time inside a battery-backed real-time clock (RTC) circuit. Date and time are used for logging events. Switch operation does not depend on the date and time; a Product Name with an incorrect date and time value functions properly. Because the date and time are used for logging, error detection, and troubleshooting, you should set them correctly.

Time zones

You can set the time zone for a switch by using the **clock TimeZone** command. The time zone setting has the following characteristics:

- The time zone setting automatically adjusts for Daylight Savings Time.
- Changing the time zone on a switch updates the local time zone setup and is reflected in local time calculations.
- By default, all switches are in the Greenwich Mean Time (GMT) time zone (0,0). If all switches in a fabric are in one time zone, it is possible for you to keep the time zone setup at the default setting.
- System services that have already started will reflect the time zone changes only after the next reboot.
- Time zone settings persist across failover for high availability.
- Time zone settings are not affected by Network Time Protocol (NTP) server synchronization.

The following regions are supported: Africa, America, Arctic, Antarctica, Asia, Atlantic, Australia, Europe, Indian, and Pacific. One of these, along with a city name, establishes the time zone. Refer to "Setting the time zone."

Time synchronization

To keep the time in your network current, it is recommended that each switch has its time synchronized with at least one external NTP server.

All switches in the fabric maintain the current clock server value in nonvolatile memory. By default, this value is the local switch clock.

The **ntp server** command accepts multiple server addresses in either IPv4 or IPv6 format. When multiple NTP server addresses are passed, **ntp server** sets the first obtainable address as the active NTP server. If there are no reachable time servers, then the local switch time is the default time.

Synchronizing local time using NTP

Perform the following steps to synchronize the local time using NTP.

1. Log in to the switch using the default password (the default password is *password*).
2. Enter **configure terminal** to change to global configuration mode.

```
switch# configure terminal
Entering configuration mode terminal
```

3. Enter the **ntp server** "*IPv4 address*" command, where *IPv4 address* is the IP address of the first NTP server in IPv4 format, which the switch must be able to access. The *IPv4 address* variable is optional. By default, this value is LOCL, which uses the local clock as the clock server.

```
switch(config)# ntp server "132.163.135.131"
```

   To display the NTP server IP address, use the **show ntp status** [**rbridge-id** *rbridge-id* | **all**] command. If you are in config mode, you must use **do** before the **show** command.

```
switch(config)# do show ntp status rbridge-id 1
```

   The request is for the local switch unless an Rbridge ID is specified. Specify the **all** parameter to send the request to all switches in the cluster.

If you need to remove an NTP server, use the **no** form of the **ntp server** command.

```
switch(config)# no ntp server "132.163.135.131"
```

Setting the time zone

You must perform this procedure on *all* switches for which the time zone must be set. However, you only need to set the time zone once on each switch, because the value is written to nonvolatile memory. While not necessary for switch operation, setting a time zone is part of ensuring accurate logging and audit tracking. Time zone changes persist through a reboot without having to save the current running config.

Use the **clock timezone** command to set the time zone.

1. If necessary, log in to the switch using an account assigned to the admin role. Be sure you are in privileged EXEC mode.
2. Enter the **clock timezone** *region/city* command.

   The following example changes the time zone to US/Pacific Standard Time.

```
switch# clock timezone America/Los_Angeles
```

Setting the clock (date and time)

The following procedure sets the local clock date and time. An active NTP server, if configured, automatically updates and overrides the local clock time. Time values are limited to between January 1, 1970 and January 19, 2038.

NOTE
You should set the clock only if there are no NTP servers configured. Time synchronization from NTP servers overrides the local clock.

1. If necessary, log in to the switch using the default password (the default password is *password*). Be sure you are in privileged EXEC mode.
2. Enter the **clock set** *year-month-day*T *hours*:*minutes*:*seconds* command.

   The following example sets the clock to March 17, 2012, 15 minutes past noon.

```
switch# clock set 2012-03-17T12:15:00
```

If you want to show the clock and time zone settings, use the **show clock [rbridge-id** *rbridge-id* | **all]** command.

```
switch# show clock
rbridge-id 1: 2012-03-17 12:15:00 America/Los_Angeles
```

Determining installed software licenses

Certain licenses are factory installed on the Brocade VDX 8770-8. To determine which licenses are enabled, use the **show license** command. The format of the command is **show license** [**rbridgeId** *rbridgeID* | **all**]. You can also use just **show license**.

```
switch# show license
RbridgeId: 1
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    FCoE Base license
    Feature name:FCOE_BASE
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    Layer 3 license
    Feature name:LAYER_3
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    VCS Fabric license
    Feature name:VCS_FABRIC
```

Each license key is represented by a string of x characters in the example above. Keep a copy of each license key for reference.

You can display the switch license ID, which is required for installing a new license. Use the command **show license id** [**rbridgeId** *rbridgeID* | **all**]. You can also use just **show license id**.

```
switch# show license id
RbridgeId        LicenseId
=======================================
1             10:00:00:05:1E:00:4C:80
```

Saving your changes

Complete the following steps to make your changes persistent. This ensures that if you must reboot the switch, the preferences you have set will be in force when the switch comes back up.

1. If necessary, log on to the switch by Telnet, using the **admin** account.
2. In privileged EXEC mode, enter the **copy running-config startup-config** command.

   ```
   switch# copy running-config startup-config
   This operation will modify your startup configuration. Do you want to
   continue? [Y/N]: Y
   ```

3. When the confirmation question appears, answer Y for Yes.

   The current running configuration, containing all of your latest changes, is saved to the startup configuration. The next time the switch reboots, all of the changes will remain in force.

Verifying correct operation

Complete the following steps to verify correct operation for the Brocade VDX 8770-8.

1. Check the LEDs to verify that all components are functional.
2. If necessary, log in to the switch by Telnet, using the **admin** account.
3. Enter the **show chassis** command to verify that the Brocade VDX 8770-8 and its components are operating correctly.
4. Enter the **show interface** command to show the status of all of the ports in the line cards.
5. Enter the **show fabric all** command to verify the operation of the Brocade VDX 8770-8 in the fabric.

Backing up the configuration

Complete the following steps to back up the configuration for the Brocade VDX 8770-8. If you back up your configuration to a USB device, be sure to use a Brocade-branded USB device. The Brocade USB device comes pre-configured with four directories, /firmware, /config, /support, and /firmwarekey. Configuration backups are automatically saved in the /config directory.

1. If necessary, log on to the switch by Telnet, using the **admin** account.
2. You can choose to back up the the startup configuration or the running configuration or both. To back up these configurations, use the **copy** command. These examples show backing up the configurations to a Brocade-branded USB device.
   a. Insert the Brocade-branded USB device into the USB port on the active management module.
   b. Enable the USB device by entering the **USB on** command.
   c. To back up the startup configuration, enter **copy startup-config usb://mystartupconfig***date*.

      The *date* portion of the target file name should be the current date to indicate when the backup was made. For example: **copy running-config usb://myrunningconfig06142012**.
   d. To back up the running configuration, enter **copy running-config usb://myrunningconfig***date*.

   Alternatively, you can save the configuration files to a remote host using either FTP or SCP. The destination file argument would be either *ftp://username:password@host_ip_address/path/filename* or *scp://username:password@host_ip_address/path/filename* respectively. Specifying a *path* is optional. As with the USB examples, be sure to append the date to the target file name.

ATTENTION
Passwords are not saved in the configuration file, and are not uploaded during a configuration upload.

NOTE
Brocade recommends that the configuration be backed up on a regular basis to ensure that a complete configuration is available for downloading to a replacement management module or Brocade VDX 8770-8. Be sure to append the date to the end of the target file names to make it clear which are the latest backups.

Connecting network devices

You can connect your chassis to a variety of network devices. Refer to the topics below for some specific requirements for making these conections.

Connecting to Ethernet devices

For copper connections to a 10/100Base-TX or 1000Base-T switch or another Brocade device, a crossover cable is required.

NOTE
The 802.3ab standard (automatic MDI or MDIX detection) calls for automatic negotiation of the connection between two 1000Base-T ports. Therefore, a crossover cable may not be required; a straight-through cable may work as well.

Connecting to workstations, servers, or routers

Straight-through unshielded twisted pair (UTP) cabling is required for direct UTP attachment to workstations, servers, or routers using network interface cards (NICs).

Fiber cabling is required for direct attachment to Gigabit NICs or switches and routers through fiber ports.

Connecting a network device to a fiber port

For direct attachment from the Brocade device to a Gigabit NIC, switch, or router, fiber cabling with an LC connector is required.

Testing connectivity

After you install the network cables, you can test network connectivity to other devices by observing the LEDs related to network connection and performing trace routes.

Installing transceivers and attaching cables

The following two sets of steps cover the installation of transceivers and cables for most SFPs and for QSFPs.

Installing SFP and SFP+ transceivers and cables

Complete the following steps to install SFP and SFP+ transceivers.

If you are implementing Brocade trunks, be aware that trunking is supported only on the 48x10GbE line card. The port groups can consist of up to 8 ports. The octet groups are ports 1-8, 9-16, 17-24, 25-32, 33-40, and 41-48.

1. Add the transceivers and cables to the line card ports.

   Position one of the optical transceivers so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

2. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented.

3. Repeat step 1 and step 2 for the remaining ports.
4. If you are using direct-attach cables, you can insert them at this time.
5. Organize the cables. Refer to "Managing cables."
6. Verify the Brocade VDX 8770-8 and port status using the **show interface** command.
7. Verify fabric connectivity using the **show fabric all** command.

Installing QSFP transceivers and cables

Complete the following steps to install the QSFP transceivers and cables in the 12x40G line cards.

Because each QSFP transceiver consists of four 10 GbE ports, be aware that any problems with one port could affect all four ports in the quad.

1. Position one of the QSFP transceivers so that the key is oriented correctly to the port.
2. Using the tab, insert the transceiver into the port until it is firmly seated. You can feel a small click when it completely seats.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

   When the transceiver is correctly seated, the status LED will turn solid amber.

3. Remove the protective plug from the QSFP transceiver and the protective cap from the special QSFP cable and insert it into the transceiver until it is firmly seated.

   The cables are also keyed to fit into the transceivers correctly.

   When the cable is correctly seated, the status LED will change from amber to green.

4. Repeat step 1 through step 3 for the remaining QSFP ports.
5. Organize the cables. Refer to "Managing cables."

Managing cables

Cables can be organized and managed in a variety of ways; for example, using cable channels on the port sides of the rack or patch panels to minimize cable management. On the Brocade VDX 8770-8 the cable management comb is located above the modules on the port side.

Following is a list of recommendations:

- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the Brocade VDX 8770-8, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.
- The minimum bend radius should be no smaller than ten times the cable radius. The minimum radius to which a 50 micron cable can be bent under full tensile load is 5.1 cm (2 in.). For a cable under no tensile load, that minimum is 3.0 cm (1.2 in.).
- If ISL trunking is in use, group the cables by trunking group.
- Generally, Velcro®-type cable restraints are recommended to avoid creating sharp bends or kinks in the cables. Do not use tie wraps with optical cables because they are easily overtightened and can damage the optic fibers.
- For easier maintenance, label the fiber-optic cables and record the devices to which they are connected.
- Do not route cables in front of the air intake vents.
- Route the cables to the top of the Brocade VDX 8770-8 through the cable comb.
- Keep LEDs visible by routing port cables and other cables away from the LEDs.

Creating Brocade inter-switch link trunks

In VCS mode, unless specifically disabled, Brocade trunking between adjacent switches is automatic in order to form the VCS cluster. This occurs only on the 48x10G line cards. All ports must be in the same port group and must be configured at the same speed. There is a limit of eight ports per trunk group. While a VCS license is required when connecting more than two switches, no separate licensing is required for Brocade trunking. For more information about Brocade trunks, see the *Brocade Network OS Administrator's Guide*.

Chapter

4

Monitoring System Components

In this chapter

- Monitoring overview 35
- Determining the status of a line card. 35
- Determining the status of a management module. 40
- Determining the status of a switch fabric module 41
- Determining the status of a power supply. 43
- Determining the status of a fan 44
- Determining the status of a CID card. 46

Monitoring overview

The Brocade VDX 8770-8 is engineered for reliability and requires no routine operational steps or maintenance. This chapter provides information about determining the status of each component using LEDs and CLI commands. Refer to the *Brocade Network OS Administrator's Guide* for additional information.

There are two commands that can be especially helpful in monitoring the health of the Brocade VDX 8770-8. These commands are **show chassis** and the various **show environment** commands. For details about these commands, refer to the *Network OS Command Reference*.

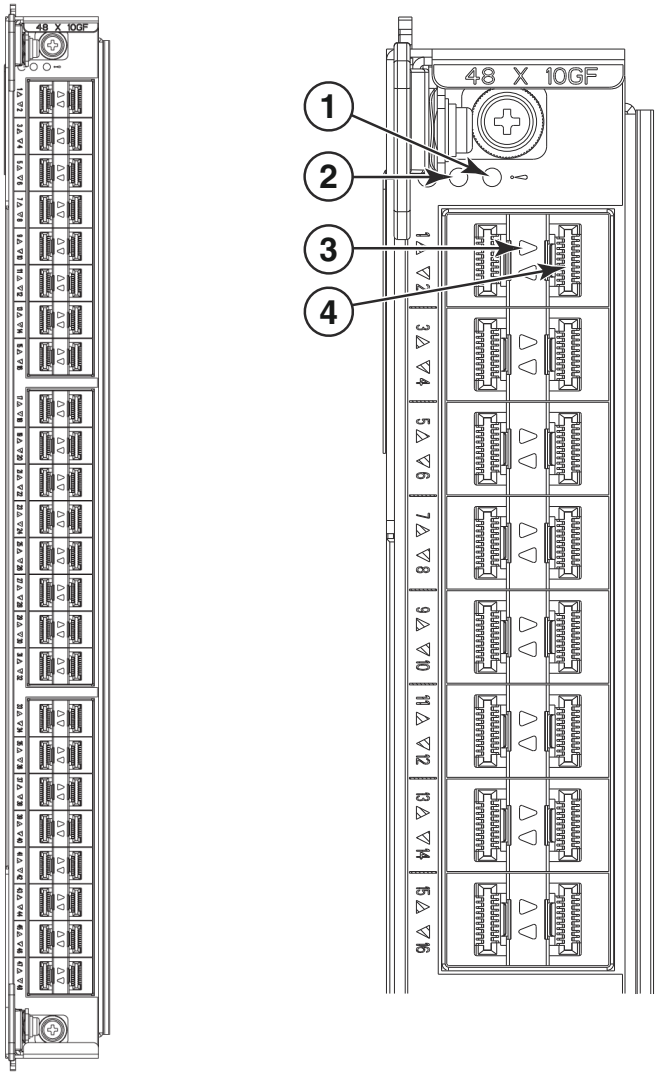
Determining the status of a line card

Use the following procedure to determine the status of a line card.

1. Check the LEDs on the module.
   - Figure 5 illustrates the 48x10G line card. The 48x1G line card looks the same except for the name on the end.
   - Figure 6 illustrates the 12x40G line card.

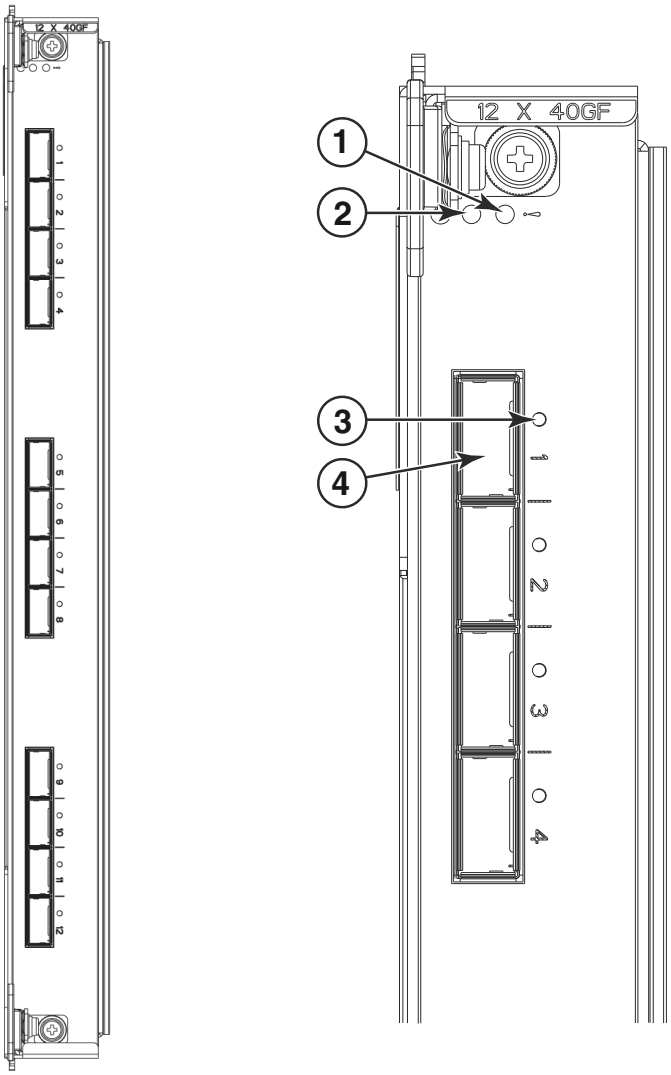
   The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, refer to Table 9.
2. You can use the **show linecard** or **show slots** command to see if your line cards are enabled. The line cards are labeled L1 through L8 in the output.The **show linecard** command limits the output to the line card slots only.
3. To check the status of the interfaces (ports) on the line card, use the **show interface** command.

Line card illustrations



1	Status LED	3	Port Status LED
2	Power LED	4	10GbE port

FIGURE 5 48x10G line card (full view and close-up)



1	Status LED	3	Port Status LED
2	Power LED	4	40GbE port

FIGURE 6 12x40G line card (full view and close-up)

Table 9 describes the line card LED indications and the recommended actions for those patterns.

TABLE 9 Line card LED descriptions

LED purpose	Color	Status	Recommended action
Power LED	No light (LED is off)	Module is not powered on.	Ensure that the module is firmly seated and either the thumbscrew is fully engaged or the slider is pushed up and the ejectors are fully engaged.
	Steady green	Module is powered on.	No action required.
Status LED	No light (LED is off)	Module is healthy or is not powered on.	Verify that the power LED is on.
	Steady amber	Module is faulty.	Ensure that the module is firmly seated and check the status by entering the **show slot** command. If the LED remains amber, consult the Brocade switch supplier..
	Slow flashing amber (on 2 seconds, then off 2 seconds)	Module is not seated correctly or is faulty.	Pull the module out and reseat it. If the LED remains amber, replace the module.
	Fast flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for the out-of-bounds environmental condition and correct it.
10 GbE Port Status (48x10G line card) or 1 GbE Port Status (48x1G line card)	No light (LED is off)	The port is disabled.	Verify that the power LED is on, check the transceiver and cable.
	Steady green	The port is online but has no traffic.	No action required.
	Flickering green	The port is online with traffic flowing htrough the port.	No action required.
	Steady amber	The port is receiving light but it is not online yet.	Reset the port by issuing a **shutdown** and **no shutdown** sequence on the port.
	Slow flashing amber (on 2 seconds, then off 2 seconds)	The port is disabled.	Enable the port by issuing a **no shutdown** command.
	Fast flashing amber (on 1/4 second, the off 1/4 second)	The transceiver or port is faulty.	Change the transceiver or reset the port by issuing a **shutdown** and **no shutdown** sequence.
	Slow flashing green (on 2 seconds, then off 2 seconds)	The port is online but segmented (either a loopback cable or incompatible switch connection).	Consult the Troubleshooting section of the *Network OS Administrator's Guide.*
	Medium flashing green (on 1 seconds, then off 1 seconds)	Beaconing (used to identify specific ports).	No action required.
	Fast flashing green (on 1/2 second, the off 1/2 second)	Internal loopback (diagnostic).	In diagnostic mode. Will return to regular mode when diagnostic is finished.

TABLE 9 Line card LED descriptions (Continued)

LED purpose	Color	Status	Recommended action
40GbE QSFP Port Status (12x40G line card) in 40G mode	No light (LED is off)	There is no QSFP transceiver installed.	Verify that the power LED is on, ensure the transceiver is fully seated or install the transceiver.
	Steady green	The port is online but has no traffic.	No action required.
	Flickering green	The port is online with traffic flowing htrough the port.	No action required.
	Steady amber	The port is receiving light but it is not online yet.	Reset the port by issuing a **shutdown** and **no shutdown** sequence on the port.
	Slow flashing amber (on 2 seconds, then off 2 seconds)	The port is disabled.	Enable the port by issuing a **no shutdown** command.
	Fast flashing amber (on 1/4 second, the off 1/4 second)	The transceiver or port is faulty.	Change the transceiver or reset the port by issuing a **shutdown** and **no shutdown** sequence.
	Slow flashing green (on 2 seconds, then off 2 seconds)	The port is online but segmented (either a loopback cable or incompatible switch connection).	Consult the Troubleshooting section of the *Network OS Administrator's Guide.*
	Medium flashing green (on 1 seconds, then off 1 seconds)	Beaconing (used to identify specific ports).	No action required.
	Fast flashing green (on 1/2 second, the off 1/2 second)	Internal loopback (diagnostic).	In diagnostic mode. Will return to regular mode when diagnostic is finished.

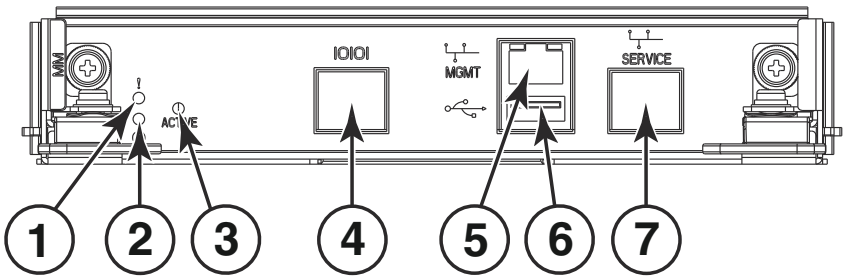
Determining the status of a management module

You must have at least one management module (MM) active for the chassis to be functional. For redundancy, you need two MMs. The active MM is designated by the blue Active LED on the front panel.

Complete the following steps to determine the status of a MM.

1. Check the LED indicators on the module (Figure 7). The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, refer to Table 10.
2. You can use the **show mm** command to see whether the management modules are enabled. You can also run the **show interface management 1/1** to see the configuration information.

Figure 7 identifies the management module.



1 Status LED
2 Power LED
3 Active LED
4 Console port (Serial)
5 Ethernet port (Mgmt IP)
6 USB port
7 Ethernet port (Service IP)

FIGURE 7 Management module

Table 10 describes the management module LED patterns and the recommended actions for those patterns.

TABLE 10 Management module LED descriptions

LED purpose	Color	Status	Recommended action
Power	Steady green	MM is powered on.	No action required.
	No light (LED is off)	MM is not powered on.	Ensure that the module is firmly seated and has power.
Status	No light (LED is off)	MM is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	MM requires attention or is still booting up.	If the LED remains amber, the module is faulty. Consult the Brocade VDX 8770-8 supplier.
Active	Steady blue	Module is the active MM.	No action required.
	No light (LED is off)	Module is booting up, negotiating to be the active MM, or is the standby MM.	No action required.
Ethernet management link (upper left)	Steady green	Ethernet link speed is 1000 Mbps (1 Gbps).	No action required.
	No light (LED is off)	There is no link or link speed is 10/100 Mbps.	No action required.
Ethernet management link activity (upper right)	Blinking green	Ethernet link is healthy and traffic is flowing through port.	No action required.
	No light (LED is off)	No traffic is flowing.	No action required.

Determining the status of a switch fabric module

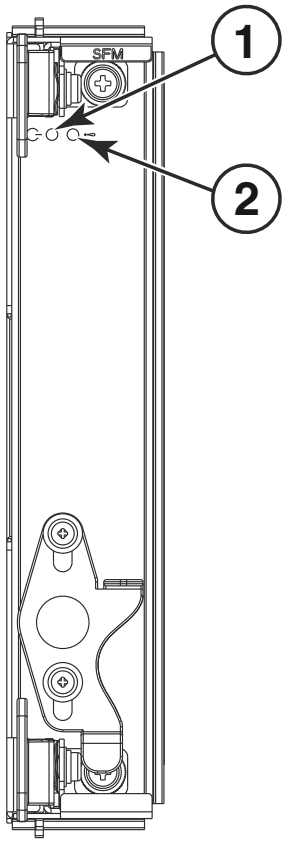
At least one functional switch fabric module (SFM) must be plugged into slots S3 or S4 (the “control plane slots”). If there are no functional SFMs in either slot during bootup, bootup is halted with a messsage indicating that condition.

In an operational chassis, if all SFMs in the control plane slots become faulty or are removed, then all the line cards will be faulted with a reason code that indicates no availability of an SFM. An external raslog message will also be displayed.

Complete the following steps to determine the status of an SFM.

1. Check the LED indicators on the SFM (refer to Figure 8). The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, refer to Table 11.
2. You can use the **show sfm** command or the **show slots** command to see whether the SFM is enabled.

Figure 8 identifies the switch fabric module.



1 Power LED

2 Status LED

FIGURE 8 Switch fabric module

Table 11 describes the switch fabric module LED patterns and the recommended actions for those patterns.

TABLE 11 Switch fabric module LED descriptions

LED purpose	Color	Status	Recommended action
Power	No light (LED is off)	SFM is not on.	Ensure that the SFM is firmly seated and the on/off switch is turned on (slider is covering the captive screw).
	Steady green	SFM is on.	No action required.

TABLE 11 Switch fabric module LED descriptions (Continued)

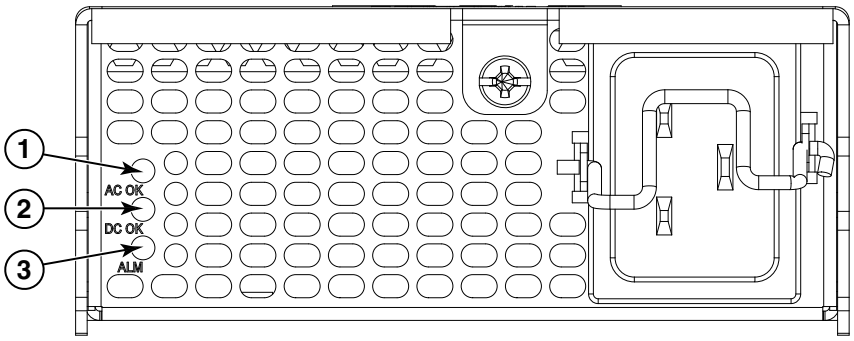
LED purpose	Color	Status	Recommended action
Status LED !	No light (LED is off)	SFM is healthy or is not powered on.	Verify that the power LED is on.
	Steady amber	SFM is faulty.	Ensure that the SFM is firmly seated and check the status by entering the **show slot** command. If the LED remains amber, consult the Brocade switch supplier..
	Slow flashing amber (on 2 seconds, then off 2 seconds)	SFM is not seated correctly of is faulty.	Pull the SFM out and reseat it. If the LED remains amber, replace the module.
	Fast flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for the out-of-bounds environmental condition and correct it.

Determining the status of a power supply

Complete the following steps to determine the status of a power supply.

1. Check the alarm LED labeled ALM on the power supply (refer to Figure 9). The LED patterns may temporarily change during POST and other diagnostic tests; for information about how to interpret the LED patterns, refer to Table 13. The Brocade VDX 8770-8 can have up to eight power supplies. Be sure to check each module.
2. Check the power supply status by entering **show environment power** {**rbridge-id** *rbridge-id*}. Refer to Table 12 for possible results from this command. You can also use the **show system** command.

Figure 9 shows a power supply.



1 AC power input LED (AC OK)
2 DC power output LED (DC OK)
3 Alarm LED (ALM)

FIGURE 9 Power supply

TABLE 12 Output for **show environment power** command

Output	Explanation
OK	Power supply is functioning correctly.
absent	Power supply is not present. Could also be improperly seated.
unknown	Unknown power supply unit installed.
predicting failure	Power supply is present but predicting failure.
faulty	Power supply is present but faulty (no power cable, power switch turned off, fuse blown, or other internal error). Could also be improperly seated.

For absent or faulty indications, if the power supply is not improperly seated, contact the Brocade VDX 8770-8 supplier to order replacement parts. You may also want to do this if the indication is predicting failure.

Table 13 describes the power supply LED patterns and the recommended actions for those patterns.

TABLE 13 Power supply LED descriptions

LED purpose	Color	Status	Recommended action
AC OK	No light (LED is off)	Power supply does not have incoming AC power.	If using AC power, ensure that the power supply is firmly seated, the AC power source is live, and the power cable is connected.
	Steady green	Power supply has incoming AC power.	No action required.
DC OK	No light (LED is off)	The DC output is not in the acceptable range.	Ensure that the power supply is firmly seated.
	Steady green	The DC output is in the acceptable range.	No action required.
ALM	No light (LED is off)	The power supply has not failed.	No action required.
	Steady amber	The power supply has failed.	Replace the power supply.

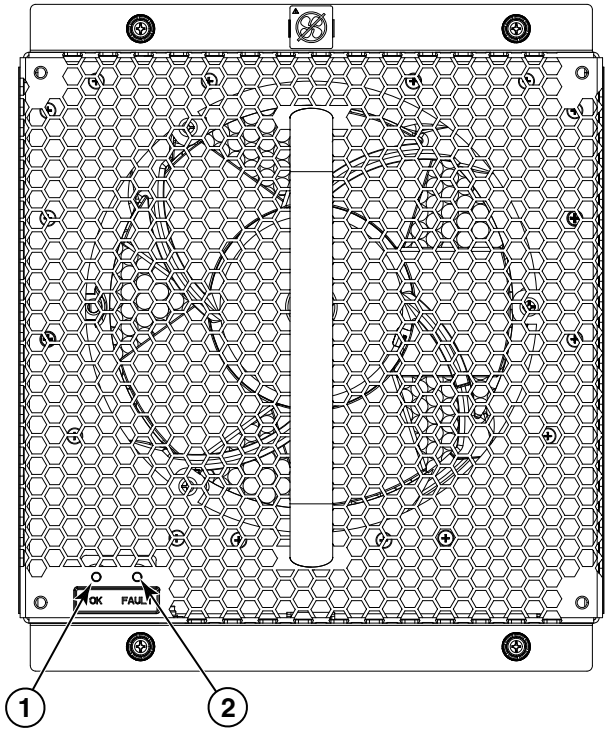
Determining the status of a fan

Complete the following steps to determine the status of a fan.

1. Check the LED indicators on the fan (refer to Figure 10). The LED patterns may temporarily change during POST and other diagnostic tests; for information about how to interpret the LED patterns, refer to Table 15. The Brocade VDX 8770-8 has up to four fans. Be sure to check each module.
2. Check the fan status using the **show environment fan** {**rbridge-id** *rbridge-id* | **all**} command.

See Table 14 for possible results from this command. The RPM of each fan is also provided. If a fan displays absent or faulty, contact the Brocade VDX 8770-8 supplier to order replacement parts. Both physically absent or faulty could also be the result of the fan not being properly seated.
You can also use the **show system** command.

Figure 10 shows a fan unit.



1 Power LED 2 Fault LED

FIGURE 10 Fan module

TABLE 14 Output for **show environment fan** command

Output	Explanation
OK	Fan is functioning correctly at the displayed speed (RPM).
absent	Fan is not present. Could also mean that the fan is improperly seated.
below minimum	Fan is present but rotating too slowly or stopped.
above maximum	Fan is rotating too quickly.
unknown	Unknown fan unit installed.
faulty	Fan has exceeded hardware tolerance and has stopped. In this case, the last known fan speed is displayed. Could also mean that the fan is improperly seated.

For absent or faulty indications, contact the Brocade VDX 8770-8 supplier to order replacement parts. You may also want to do this if the indication is below minimum or above maximum.

Table 15 describes the LED patterns for the fan.

TABLE 15 Fan LED descriptions

LED purpose	Color	Status	Recommended action
OK	No light (LED is off)	Fan does not have power.	Ensure that the fan is firmly seated and has power.
	Steady green	Fan has power.	No action required.
Fault	No light (LED is off)	Fan is either healthy or does not have power.	Ensure that the fan has power.
	Steady amber	Fan has a failure (full or partial).	Replace the fan.

Determining the status of a CID card

Regular validation tests are run by the system comparing the CID cards to each other. If the information is identical, then the chassis is operating correctly. Once a mismatch is detected, an FFDC message is logged to this effect. Additional error messages are generated until the problem is resolved. If you experience a CID card failure, call Brocade Technical Support.

Chapter

5

Removal and Replacement Procedures

In this chapter

- Introduction 47
- ESD precautions 47
- Cable management comb removal and replacement. 48
- Line card removal and replacement 49
- Management module removal and replacement 52
- Switch fabric module removal and replacement. 54
- Power supply removal and replacement 57
- Fan removal and replacement 60
- Air filter removal and replacement. 62
- Module filler panel removal and replacement 63
- Chassis ID card removal and replacement 64
- SFP transceiver removal and replacement 65
- QSFP transceiver removal and replacement 67
- Cable routing table 68

Introduction

NOTE
Read the safety notices before servicing (“Safety notices”).

The field-replaceable units (FRUs) in the Brocade VDX 8770-8 can be removed and replaced without special tools. The Brocade VDX 8770-8 can continue operating during many of the FRU replacements if the conditions specified in the procedures are followed.

The following sections contain FRU removal and replacement procedures.

DANGER
The procedures in this manual are for qualified service personnel.

ESD precautions

The Brocade VDX 8770-8 contains ESD-sensitive FRUs. When working with any Brocade VDX 8770-8 FRU, use correct electrostatic discharge (ESD) procedures.

- Wear a wrist grounding strap connected to chassis ground (if the Brocade VDX 8770-8 is plugged in) or a bench ground. Refer to "Port side of the Brocade VDX 8770-8" on page 3 for the location of the ESD jack.
- Store ESD-sensitive components in antistatic packaging.

Cable management comb removal and replacement

The Brocade VDX 8770-8 can continue to operate during the replacement of the cable management comb.

Time and items required

The replacement procedure for the cable management comb takes less than five minutes. A #1 Phillips screwdriver is required. See Figure 11.

Removing a cable management comb

Complete the following steps to remove the cable management comb.

1. Remove the cables from the cable management comb and rearrange the cables around the comb.
2. Unscrew and save the four (4) screws holding the comb to the chassis. Retain the screws. Support the comb to prevent it from falling.
3. Remove the comb.

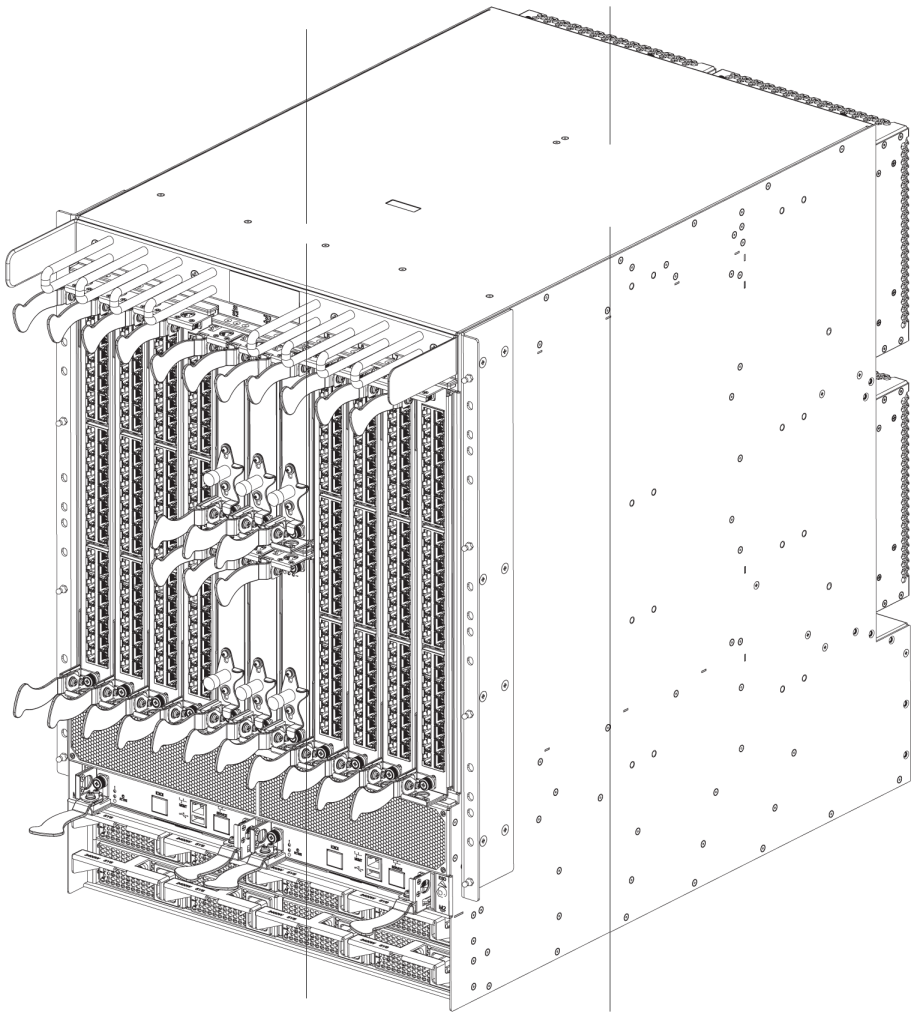


FIGURE 11 Removal and replacement of the cable management comb

Replacing a cable management comb

Complete the following steps to replace the cable management comb.

1. Position and tighten the four (4) screws to secure the new comb to the chassis.
2. Arrange the cables in the comb.

Line card removal and replacement

This section describes how to remove and replace line cards. It does not cover the management modules or the switch fabric modules. It covers the removal and replacement of line cards of the same type. If you need to replace a line card with a line card of a different type, please consult the *Brocade Network OS Administrator's Guide*.

ATTENTION
Any slot that is not occupied by a line card should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

Line card slots are numbered from L1 through L8, from left to right when facing the port side of the Brocade VDX 8770-8. They are in two groups of four, L1 through L4 on the left and L5 through L8 on the right.

NOTE
The 48x1G, 48x10G, and 12x40G line cards are compatible with the Brocade VDX 8770-8.

Time and items required

The replacement procedure for each line card takes less than 10 minutes. Removing and restoring transceivers and cables may take longer depending on how many must be changed. The following items are required for the line card replacement:

- Electrostatic discharge (ESD) grounding strap
- Workstation computer
- Replacement line card or filler panel
- #2 Phillips screwdriver
- Small form-factor pluggable (SFP or SFP+) or QSFP transceivers (as needed)
- Optical and copper cables (as needed)

NOTE
For information about the transceivers that are qualified for the Brocade chassis, refer to http://www.brocade.com/downloads/documents/matrices/Brocade_Compatibility_Matrix.pdf.

Removing a line card

For this procedure, refer to Figure 12.

Complete the following steps to remove a line card.

ATTENTION
If multiple modules are being replaced, complete the replacement for one module at a time.

ATTENTION
Follow ESD precautions while removing any line card.

1. Check for adequate cable slack. Ensure there is plenty of cable slack to remove a line card without cable obstruction.
2. Ensure that the part number on the line card being replaced matches the replacement part number.
3. Power down the existing line card using the **power-off linecard** *slot_number* command.

NOTE
Before removing any cables from a line card, note the cable order (identify each cable by its physical port). It is a good practice to keep a table of cable to port mapping. Refer to "Cable routing table" for a blank cable routing table.

4. Disconnect all cables and transceivers from the line card.
5. Unscrew the two captive screws at the ends of the line card using the Phillips screwdriver.
6. Open the ejectors by rotating them toward the center of the line card face. Pull the line card out of the chassis using the ejectors.
7. If you are replacing the line card with a line card of a different type, enter **config terminal** to enter configuration mode, then the **no linecard** *slot_number* command. This removes the line card configuration and its associated interface configuration from the chassis database so a different type of line card can be used in the slot.

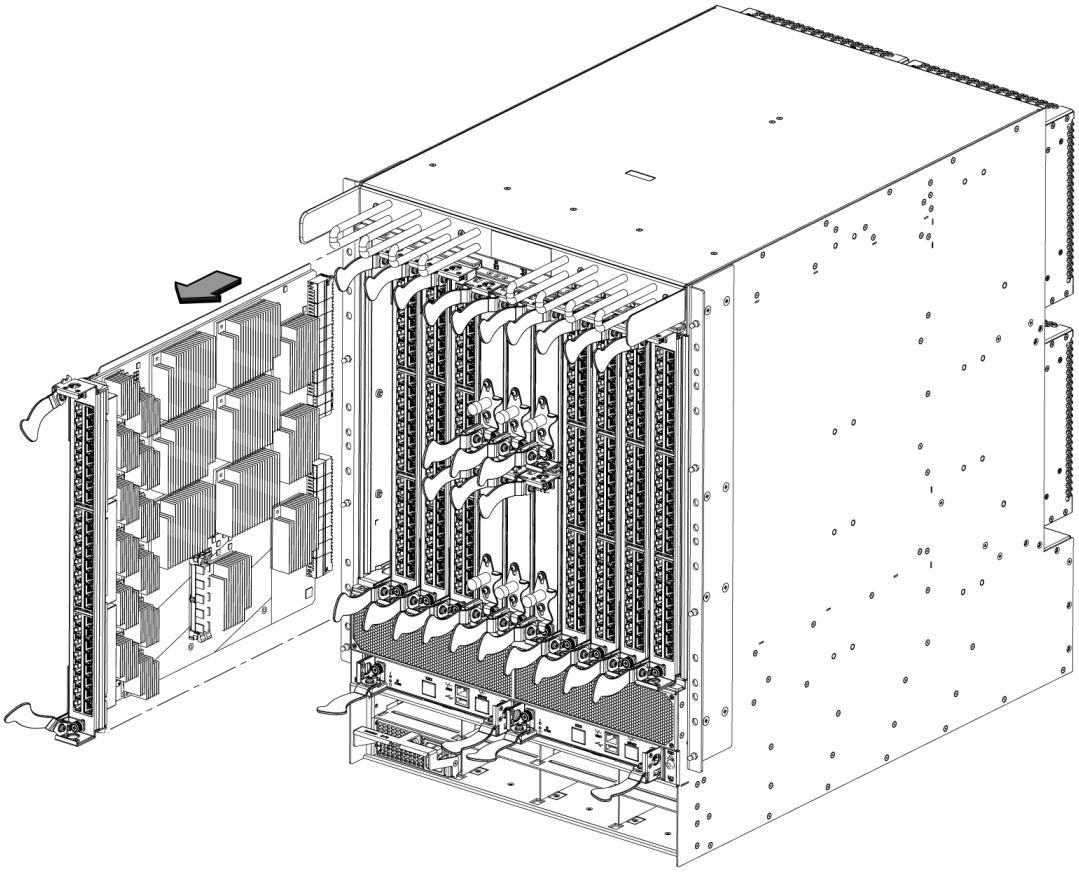


FIGURE 12 Removal and replacement of a line card (48x10G card shown)

Replacing a line card

For this procedure, refer to Figure 12.

Complete this procedure to insert a new line card.

1. Unpack the new line card and remove it from the anti-static bag.
2. Inspect the module for damage.
3. Remove the protective covers from the backplane connectors.
4. Orient the line card so that the ports are at the front of the switch.
5. Open the ejectors by rotating them toward the center of the line card face and align the flat side of the line card inside the top and bottom rail guides in the slot. Line cards can be inserted in any of the slots labelled L1 through L8.
6. Slide the line card all the way into the slot.
7. Close the ejectors by rotating them away from the center of the line card. The levering action of the ejectors seats the line card in the slot.
8. Tighten the captive screws using the Phillips screwdriver.

Management module removal and replacement

This section describes how to remove and replace a management module (MM). Each Brocade VDX 8770-8 chassis can have one or two management modules. They reside in slots M1 and M2. There must be at least one MM installed for the chassis to operate.

Time and items required

The replacement procedure for the MM takes approximately 30 minutes. The following items are required for the MM replacement:

- ESD grounding strap
- Workstation computer
- Serial cable
- IP address of an FTP server for backing up the Brocade VDX 8770-8 configuration
- #2 Phillips screwdriver
- Replacement management module

Faulty management module indicators

Confirm that you need to replace the management module. The following events might indicate that a management module is faulty:

- The status LED on the management module is lit steady amber, or the power LED is not lit.
- The management module does not respond to Telnet commands, or the serial console is not available.
- The **show mm** command does not show that the management module is enabled.
- Additional information from the **show mm** command indicates a problem.
- The clock is inaccurate, or the management module does not boot up or shut down normally.

For more information about error messages, refer to the *Network OS Message Reference*.

Recording critical Brocade VDX 8770-8 information

Back up the chassis configuration before you replace a management module. Refer to "Backing up the configuration" on page 31 for backup information.

Removing a management module

For this procedure, please refer to "ESD precautions" and Figure 13.

The chassis continues to operate while a management module is being replaced if the redundant management module is active and a failover has already occurred.

Complete the following steps to remove a management module.

1. Remove any cables connected to the module.
2. Unscrew the captive screws from both ejectors using the Phillips screwdriver.
3. Rotate both ejectors simultaneously toward the center of the module.
4. Pull the management module out of the chassis by the ejectors.

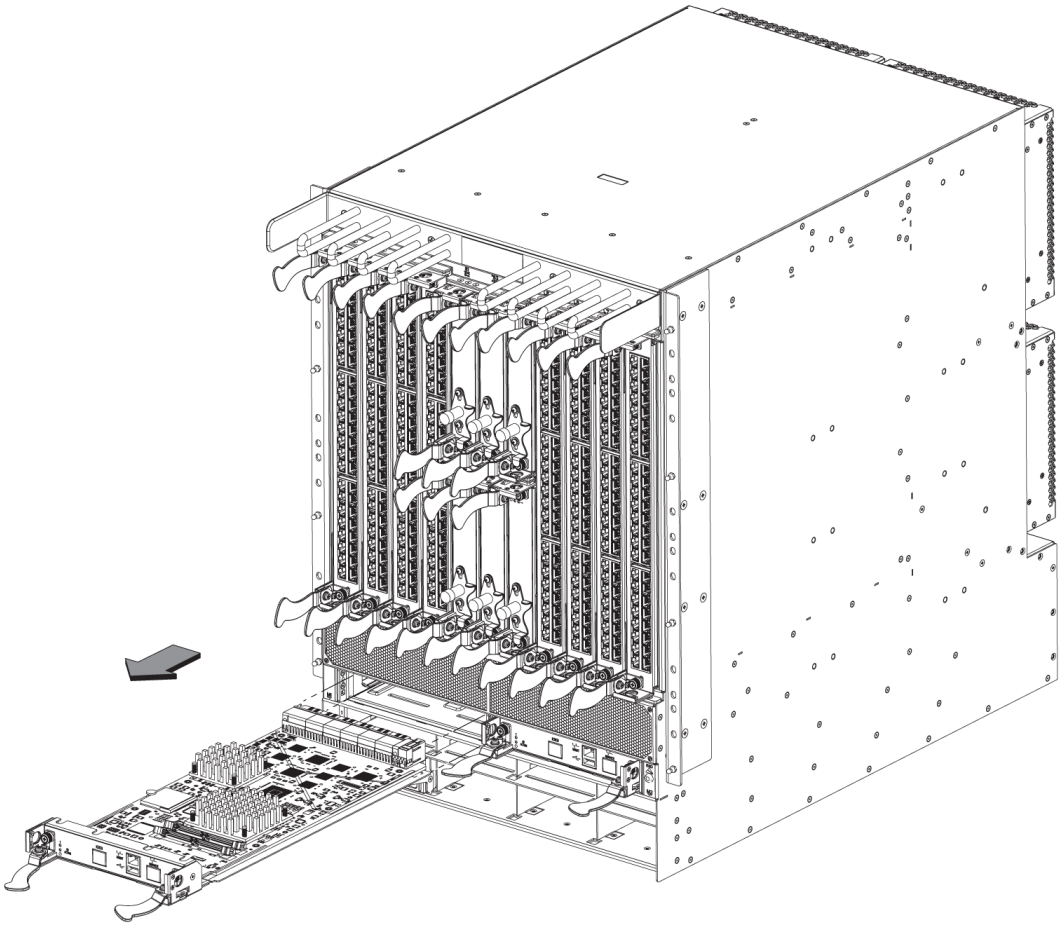


FIGURE 13 Removal and replacement of the management module

Replacing a management module

For this procedure, please refer to "ESD precautions" and Figure 13.

Complete the following steps to insert an MM.

1. Unpack the new MM and remove it from the anti-static bag.
2. Inspect the module for damage.
3. Remove the protective caps from the b ackplane connectors.
4. Rotate the ejectors toward the center of the module.
5. Align the module pan with the guides in the slot. The first MM should be installed in slot M1.
6. Slide the MM into the slot until it is firmly seated.
7. Rotate the ejectors away from the center of the module face until the module is tight in the slot.
8. Tighten the captive screws using the Phillips screwdriver.

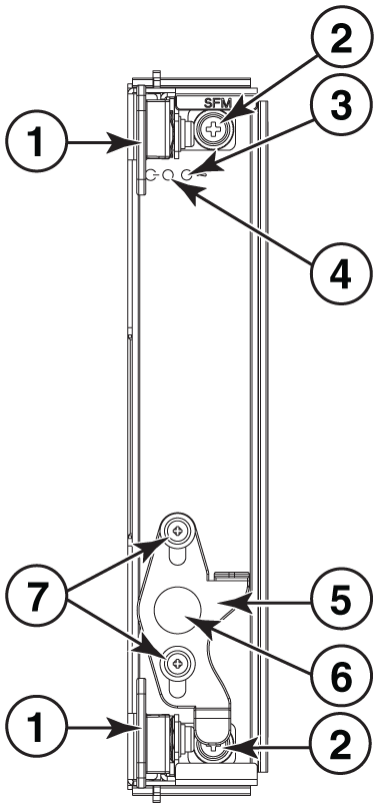
Switch fabric module removal and replacement

This section describes how to remove and replace a switch fabric module (SFM). The Brocade VDX 8770-8 has up to six SFMs. They can be installed only in slots S1 through S6. There must be at least one SFM installed in either slot S3 or slot S4. Refer to Figure 14.

Time and items required

The replacement procedure for the SFM takes approximately 10 minutes. The following items are required for the SFM replacement:

- ESD grounding strap
- Phillips #2 screwdriver
- Replacement SFM



1	Ejectors	5	Slider
2	Thumbscrews	6	Power enable pin
3	Status LED	7	Slider screws
4	Power LED		

FIGURE 14 SFM front view

Removing a switch fabric module

The Brocade VDX 8770-8 continues to operate while an SFM is being replaced. Refer to Figure 15 for the following procedure.

ATTENTION
Follow ESD precautions.

1. Unscrew the power enable pin.
2. Loosen the two screws on the slider using the Phillips screwdriver if necessary.
3. Pull out the pin and move the slider all the way up, exposing the captive screw.
4. Unscrew the two captive screws using the Phillips screwdriver.
5. Open the ejectors by rotating them toward the center of the module face. Pull the SFM out of the chassis using the ejectors.

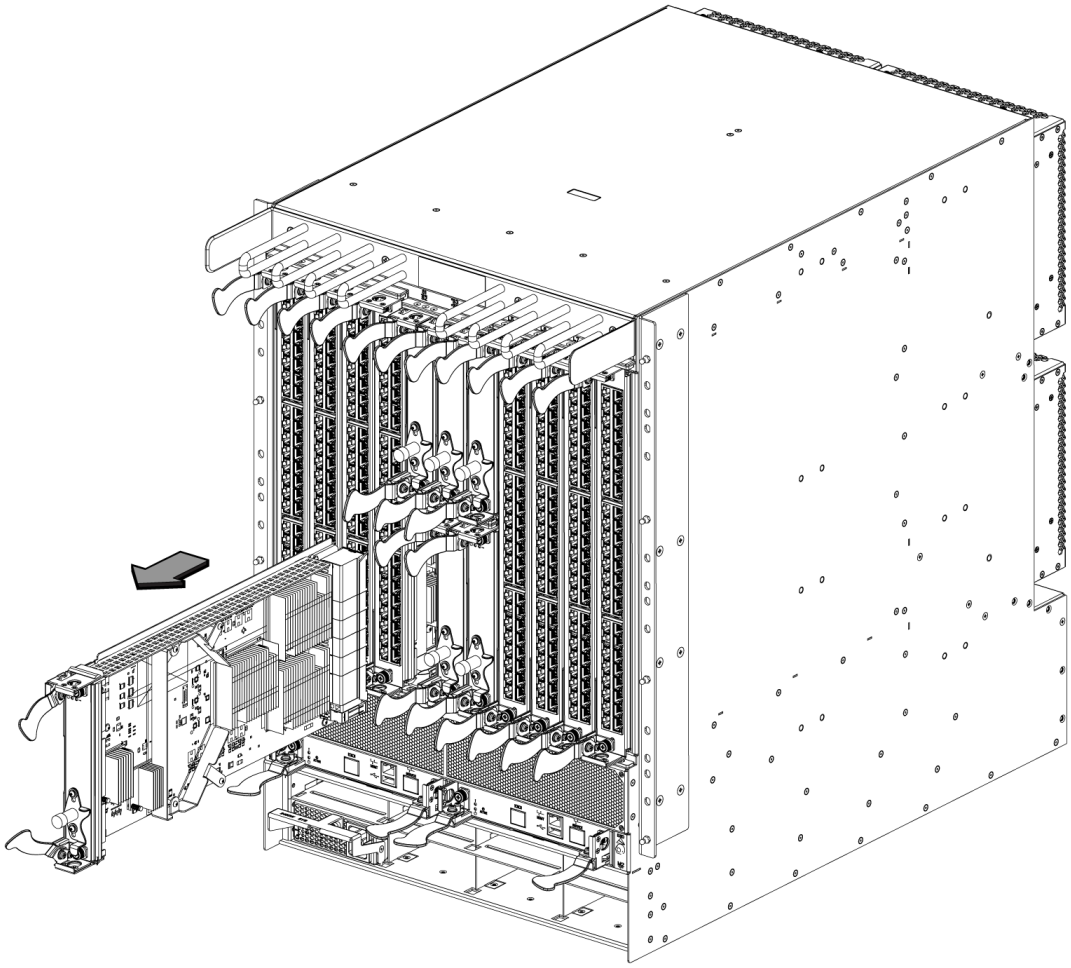


FIGURE 15 Removal and replacement of the switch fabric module

Replacing a switch fabric module

Complete the following steps to insert the SFM.

1. Unpack the new SFM and remove it from the anti-static bag.
2. Inspect the module for damage.
3. Remove the protective caps from the backplane connectors.
4. Unscrew the power enable pin, pull it outward, and move the slider toward the center of the module face.
5. Open the ejectors on the new SFM by rotating them toward the center of the module face. Orient the switch fabric module so that the ejectors are toward you.
6. Align the module pan with the guides in the slot. The first SFM ashould be installed in slot S3.
7. Push the SFM firmly into the slot.
8. Close the ejectors by rotating them away from the center of the SFM. The levering action of the ejectors seats the module in the slot.

9. Tighten the captive screws using the Phillips screwdriver.
10. Pull out the power enable pin and move the slider all the way down.
11. Screw in the power enable pin.
12. Tighten the screws on the slider.

Power supply removal and replacement

Use this procedure to remove and replace a power supply.

NOTE
Depending on the module configuration of the chassis and the number of power supplies installed, the Brocade VDX 8770-8 may be able to continue operating during the replacement. Refer to "Power specifications" on page 13 to determine your power requirements. If insufficient power is present, the chassis will start powering down modules until the power demand can be met.

DANGER
Disconnect the power cords from all power sources to completely remove power from the chassis.

Time and items required

The replacement procedure for each power supply takes less than five minutes.

- A new power supply unit or filler panel is required for the power supply replacement.
- A #1 Phillips screwdriver.
- A #2 Phillips screwdriver.

Removing an AC power supply

For the following procedure, refer to Figure 16.

To remove a power supply, complete the following steps.

1. Perform the appropriate following action based on whether the Brocade VDX 8770-8 is operating:
   - If the Brocade VDX 8770-8 is not operating during the replacement procedure, go to step 2.
   - If the Brocade VDX 8770-8 is operating and will continue to operate during the replacement, check the power LEDs to verify that the minimum number of power supplies is functioning. Refer to Table 3 and Table 4 in "Installation of the Brocade VDX 8770-8" to check your power requirements.
2. Unlatch the power cord retainer clip.
3. Remove the power cord.
4. Loosen the captive screw.

5. Push down on the handle to eject the power supply.
6. Grasp the handle and pull, sliding the power supply from the chassis and supporting the power supply from beneath as you remove it.

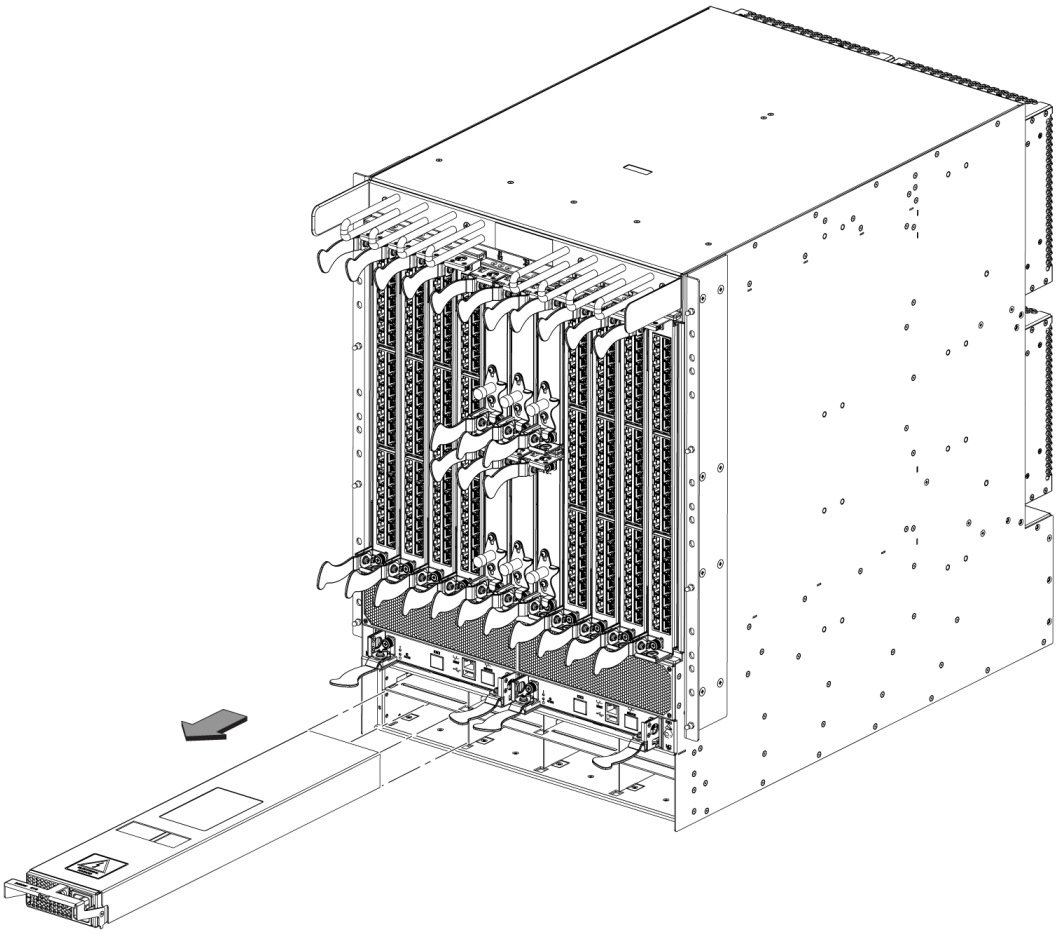


FIGURE 16 Removal and replacement of the power supply

Replacing an AC power supply

If you are not replacing the power supply, insert a filler panel into the slot.

For the following procedure, refer to Figure 16.

To replace a power supply, complete the following steps.

DANGER

High Touch Current. Earth connection is essential before connecting the power supply.

1. Unpack the new power supply and remove it from the anti-static bag.
2. Inspect the power supply for damage.

3. Ensure that the handle of the replacement power supply is pushed down.
4. Insert the power supply into the slot.
5. Rotate the handle upward to fully seat the power supply.
6. Tighten the captive screw.

Removing a DC power supply

To remove a DC power supply, complete the following steps.

1. If the Brocade VDX 8770-8 is operating and will continue to operate during the replacement, check the power LEDs to verify that the minimum number of power supplies is functioning. Refer to Table 3 and Table 4 in "Installation of the Brocade VDX 8770-8" to check your power requirements.
2. Disconnect the power supply from the power source.
3. Use a #1 Phillips screwdriver to remove the screw that secures the safety cover over the power lugs. Remove the safety cover.
4. Use a #2 Phillips screwdriver to unscrew the power lugs.
5. Loosen the captive screw underneath the latch handle on the power supply faceplate.
6. Push down on the handle to eject the power supply.
7. Grasp the handle and pull, sliding the power supply from the chassis and supporting the power supply from beneath as you remove it.

Replacing a DC power supply

If you are not replacing the power supply, insert a filler panel into the slot.

To replace a DC power supply, complete the following steps.

1. Unpack the new power supply and remove it from the anti-static bag.
2. Inspect the power supply for damage.
3. Use a #1 Phillips screwdriver to remove the screw that secures the safety cover over the power lugs. Remove the safety cover.
4. Ensure that the handle of the replacement power supply is rotated down.
5. Insert the power supply into the slot.
6. Rotate the handle upward to fully seat the power supply.
7. Tighten the captive screw.

ATTENTION
This equipment installation must meet NEC/CEC code requirements. Consult local authorities for regulations.

Fan removal and replacement

Use this procedure to remove and replace a fan.

ATTENTION
The Brocade VDX 8770-8 can continue operating during the fan replacement.

Time and items required

The replacement procedure for each fan takes less than 5 minutes. The following items are required for the fan replacement:

- Replacement fan
- #2 Phillips screwdriver

Removing a fan

For the following procedure refer to Figure 17.

Complete the following steps to remove a fan from the chassis.

1. Before removing a fan, verify that the other fans are functioning properly. The power LEDs should be steady green.

DANGER
Be careful not to insert your fingers into the fan while removing it from the device. The fan may still be spinning at high speed.

2. Use the screwdriver to loosen the four captive screws at the top and bottom of the fan.
3. Grasp the handle and pull, sliding the fan from the chassis and supporting the fan from beneath as you remove it.

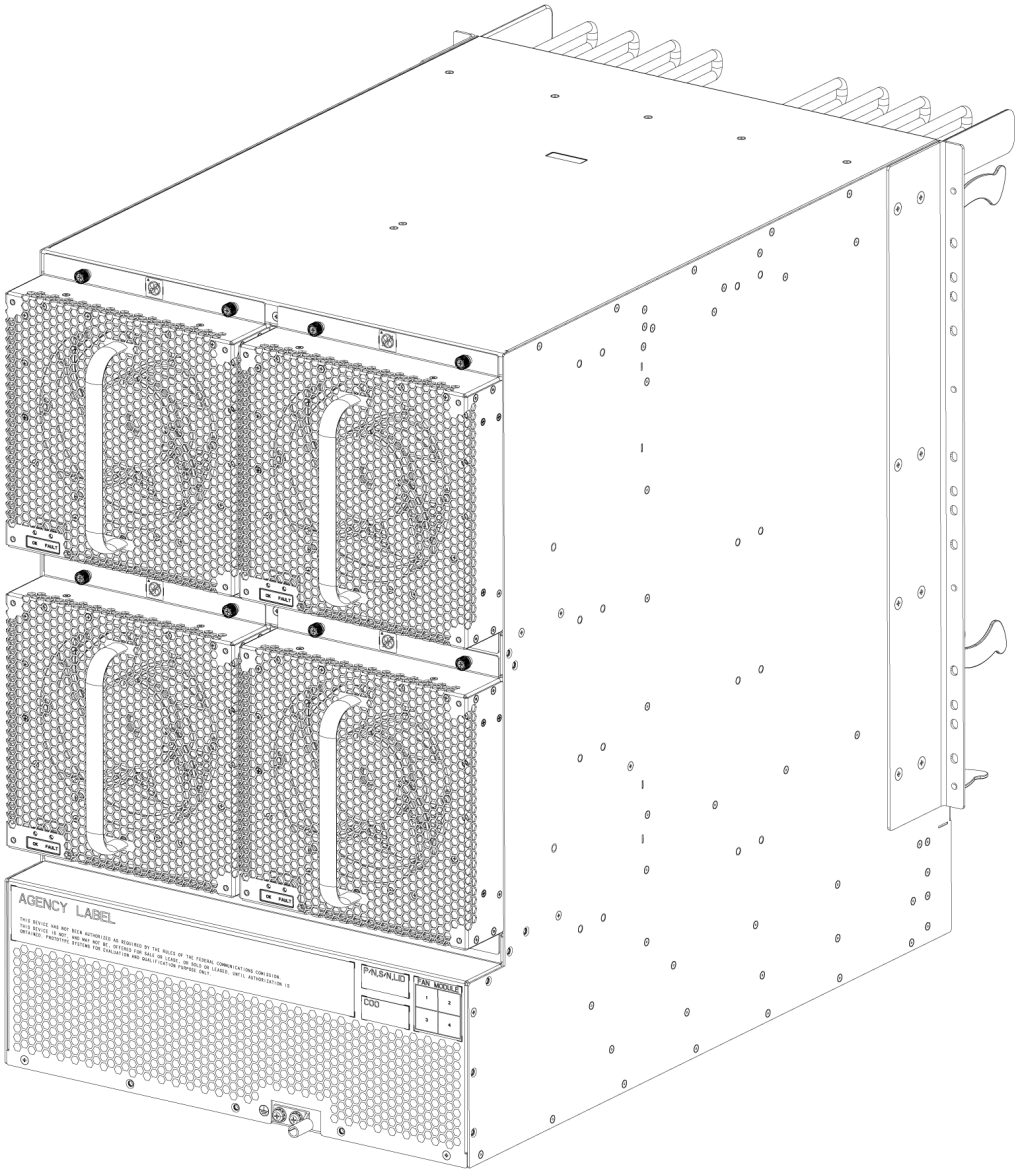


FIGURE 17 Removal and replacement of the fan

Replacing a fan assembly

For the following procedure refer to Figure 17.

Complete the following steps to replace the fan in a chassis.

1. Orient the fan and slide it into the chassis, pushing firmly to ensure that it is seated.
2. Verify that the power LED displays a green light.
3. Use the screwdriver to tighten the four captive screws.

Air filter removal and replacement

You can remove and replace an air filter when it gets too clogged with dirt and dust to operate efficiently. You should perform regular physical inspections to determine how often to replace the filter. Maintaining clean air filters ensures optimal airflow through the devices.

Based on the traffic and particulate levels of the installation location, the site operator should determine the appropriate replacement intervals are for the filter.

If the filter were to become sufficiently blocked the thermal policy of the device would notify the administrator of an environmental issue with the system.

If a site-specific interval cannot be determined by the site operator, the filter should be replaced on an interval of every 3 months.

The filters are single use, non-recyclable. They have a UL fire rating of FLAME RETARDANT,UL 94HF-1 UAF and PPI measurement of 25.

Use this illustration as a reference. The chassis is shown in a two-post mid-mount rack configuration, but the mounting of the air filter is the same for any rack mount.

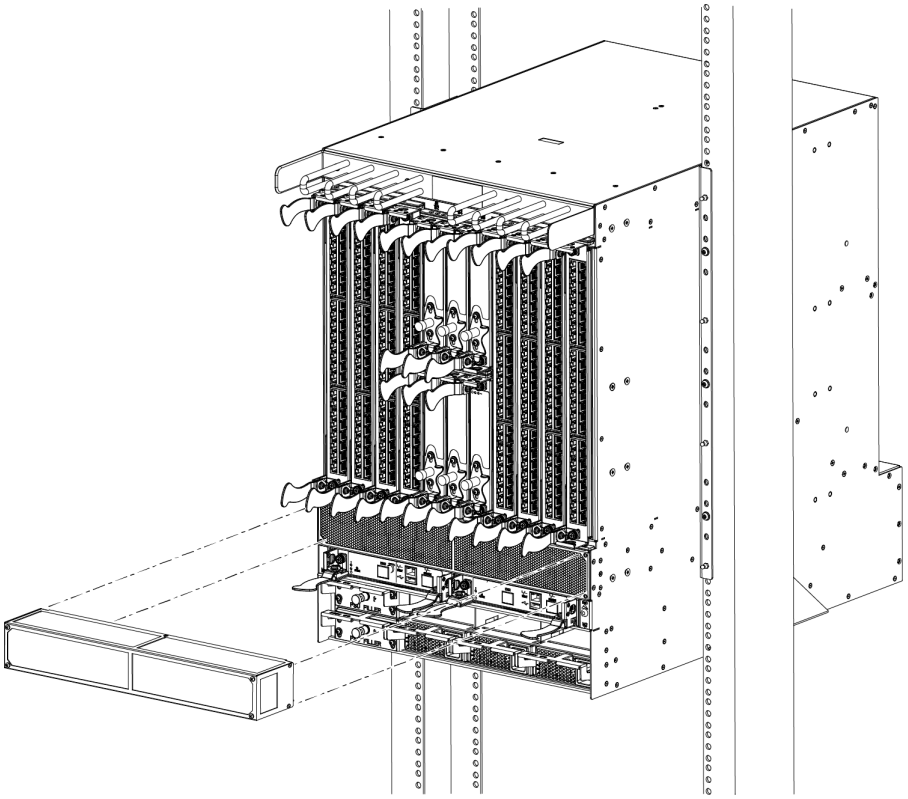


FIGURE 18 Removal and replacement of the air filter

Time and items required

The replacement procedure for the air filter takes less than five minutes. Be sure to have the following items available.

- A new air filter
- A #2 Phillips screwdriver

Removing an air filter

Complete the following steps to remove an air filter from the chassis.

1. While holding the air filter in place, unscrew the four captive mounting screws using the #2 Phillips screwdriver.
2. Carefully remove the air filter from the chassis.

   To avoid having captured particulates drawn into the chassis, remove the filter in a fashion that maintains the orientation of the filter relative to the system until the filter is 12 inches away from the intake.

Replacing an air filter

Complete the following steps to mount the new air filter on the chassis.

1. Orient the new filter over the four mounting holes using the screws as guides.

   Be sure the side marked BOTTOM is on the bottom.
2. Using the #2 Phillips screwdriver, initiate the threads, two turns per screw, until all four are started.
3. Tighten all four screws, one at a time.

   Do not overtighten the screws as this will compromise the frame, admitting unfiltered air.

Module filler panel removal and replacement

This section describes how to remove and replace module filler panels. Each removable module in the chassis (except the fans) has a matching filler panel that must be in place if no module is installed in a slot. This includes management modules, switch fabric modules, line cards, and power supplies. There are no filler panels for the fans since all fans must be installed on the chassis.

NOTE
The filler panels have release pins and sliders to hold them in place.

Removing a filler panel

Complete the following steps to remove a filler panel from the chassis.

ATTENTION
A filler panel should be removed only when being replaced with a new module or another filler panel. Any slot that is not occupied by a module should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

Filler panels for the MM and SFM are the same. The filler panel for the line card slot is similar, though larger. Both the MM/SFM panels and line card panels have two release pins and sliders. The filler panel for the power supply slot is quite different, having only one release pin and slider.

1. Pull the release pin or pins out and simultaneously move the slider or sliders.

   The entire face of the power supply filler panel is a slider and it moves upward to release the panel.

   The sliders for the MM/SFM and line card filler panels move toward the center of the panel to release it.

2. Pull the filler panel out of the chassis using the release pins.

Replacing a filler panel

Do not leave a slot empty. This will adversely affect cooling of the chassis.

1. Orient the filler panel.

   The MM/SFM and line card filler panels must be aligned with the slot guides.

   The power supply filler panels simply fit into the slots.

2. Slide the filler panel into the slot until it is firmly seated.

   The power supply panel may slide too far into the slot. Insert it only until the facing matches the facing of the other power supplies or filler panels.

3. Move the sliders and release the release pins.

   The release pins should retract completely.

Chassis ID card removal and replacement

CID cards cannot be removed or replaced by customers. If you experience a CID card failure, call Brocade Technical Support.

When an error is detected, you can run the CID Recovery Tool to pinpoint the problem and, in some cases, fix it. If the problem is determined to be in the critical seeprom portion of the card, no recovery is possible and you must contact Brocade Technical Support. If however, the problem is in the non-critical seeprom, it is possible that you can use the recovery tool to fix the problem. See Table 16 for the various options for recovery.

To run the CID recovery tool, enter the following command in Privileged EXEC mode.

```
sw0# cidrecov
```

If the problem is in the critical seeprom, the output indicates that you should call Brocade Technical Support. If the problem is in the non-critical seeprom, the output describes the issue and the affected data and gives you several possible options for action.

For more detail concerning tese options, refer to the “Using the Chassis ID (CID) Recovery Tool” chapter in the *Brocade Network OS Administrator’s Guide* and the “cidrecov” topic in the *Network OS Command Reference*.

TABLE 16 Options for the CID Recovery Tool

Condition	Recovery option
One non-critical seeprom is corrupted.	Tool displays the CID to be recovered and prompts to continue or abort.
Both non-critical seeproms are corrupted.	Tool displays both CIDs to be recovered with default data and prompts to continue or abort.
Neither non-critical seeprom is corrupted but there is a data mismatch.	Tool prompts for the CID to be recovered or to abort.
No corruption or mismatch is found.	Tool displays that there is nothing to be done and then exits on acknowledgement.

SFP transceiver removal and replacement

Use the following procedure to remove and replace an SFP or SFP+ transceiver.

DANGER

All fiber-optic interfaces use Class 1 lasers.

DANGER

Laser radiation. Do not view directly with optical instruments. Class 1 laser products.

Time and items required

The replacement procedure for one transceiver takes less than five minutes. You should have the following items available:

- Replacement SFP or SFP+ transceiver
- Optical transceiver extraction tool

Most Brocade switches and backbones come with a transceiver extraction tool (Figure 19) and holster. The extraction tool is designed to remove transceivers from modules where the space is limited.

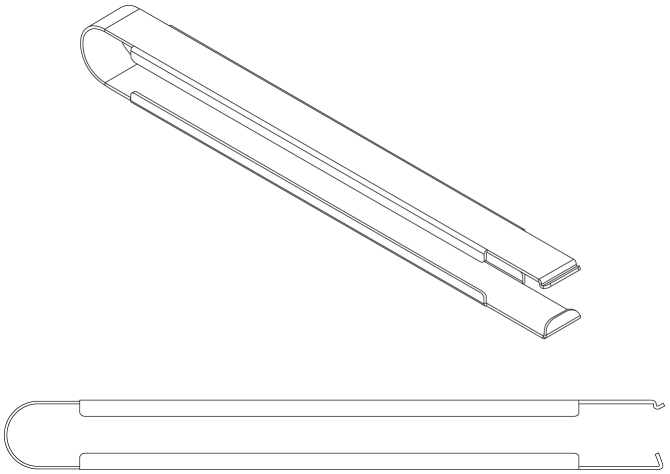


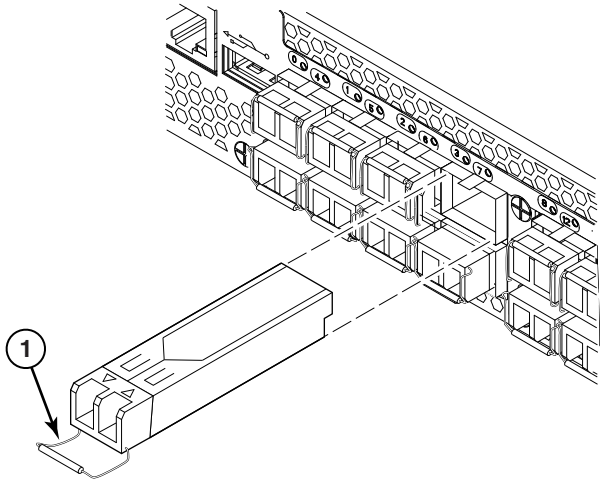
FIGURE 19 Optical transceiver extraction tool

Removing a transceiver

For the following procedure refer to Figure 20.

Complete the following steps to remove an SFP or SFP+ transceiver.

1. Remove any cables that are inserted into the transceiver. Use the extraction tool to open the cable latching mechanism.
2. Using the hooked end of the tool, pull the bail (wire handle) away from its pivot point and out, sliding the transceiver out of the switch or module.



1 SFP or SFP+ bail

FIGURE 20 Optical transceiver with bail open

Replacing a transceiver

For the following procedure refer to Figure 20.

Complete the following steps to replace an SFP or SFP+ transceiver.

1. Making sure that the bail (wire handle) is in the unlocked or open position, position the optical transceiver so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

2. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented.

QSFP transceiver removal and replacement

Use this procedure to remove and replace a QSFP transceiver. Because each QSFP consists of four 10 GbE ports, be aware that any problems with one port could affect all four ports in the quad.

DANGER

All fiber-optic interfaces use Class 1 lasers.

DANGER

Laser radiation. Do not view directly with optical instruments. Class 1 laser products.

Removing a QSFP transceiver

Complete the following steps to remove a QSFP transceiver.

1. Remove the cable from the transceiver.
2. Using the integrated tab, remove the QSFP transceiver from the port.
3. Insert a protective plug into the transceiver and put it aside.

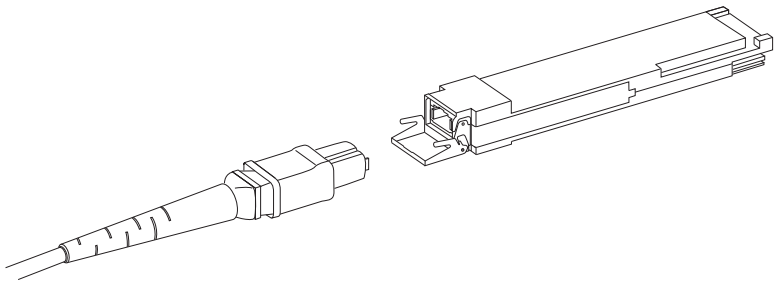


FIGURE 21 QSFP cable and transceiver with bail open

Replacing a QSFP transceiver

Complete the following steps to replace a QSFP transceiver.

1. Position the new QSFP transceiver so that the key is oriented correctly to the port.
2. Using the integrated tab, insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.
3. Remove the protective plug from the transceiver.
4. Position the cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented.

Cable routing table

Table 17 is a 48-port template for a cable routing table. Make copies of the table to cover the total number of ports in the Brocade VDX 8770-8.

TABLE 17 Cable routing table for the Brocade VDX 8770-8 (48 ports shown)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		
	1				
	2				
	3				
	4				
	5				
	6				
	7				

TABLE 17 Cable routing table for the Brocade VDX 8770-8 (48 ports shown) (Continued)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	**Port**	**Switch end**	**Device end**		
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				
	36				
	37				
	38				
	39				
	40				
	41				
	42				

TABLE 17 Cable routing table for the Brocade VDX 8770-8 (48 ports shown) (Continued)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	**Port**	**Switch end**	**Device end**		
	43				
	44				
	45				
	46				
	47				
	48				

Appendix

Specifications

A

In this appendix

- General specifications. 71
- System architecture. 71
- System size and weight. 72
- System component weights 72
- Ethernet port supported optics 73
- Power cords 74
- Safety notices 77
- NEBS requirements. 77
- Regulatory compliance 78
- Environmental regulation compliance 81

General specifications

The Brocade VDX 8770-8 is compliant with United States and international safety and Electromagnetic Compatibility (EMC) standards. Table 18 lists the general specifications for the Brocade VDX 8770-8.

TABLE 18 General specifications

Specification	Description
System architecture	Nonblocking, shared memory, virtual output queued
System processor	1.5 GHz
Classes of service	8
Port to port latency	3.63 µs

System architecture

Table 19 describes the system architecture of the Brocade VDX 8770-8.

TABLE 19 System architecture

Feature	Description
Ethernet Ports	Up to 384 ports.
Control Processor	Redundant (active/standby) management modules.

TABLE 19 System architecture (Continued)

Feature	Description
Scalability	Full fabric architecture: * see the Network OS 3.x Release Notes for the most up-to-date information.
Brocade ISLs)and Brocade Trunking	Interfaces (line card ports) automatically come up as Fabric inter-switch links (Fabric ISLs) in VCS mode. If ISL formation fails, the interfaces come up as edge ports. Trunk groups of up to eight ports are supported on the 48x10G line card only.
Media types	1 GbE optical 1 Gb copper SFP 10 GbE optical 10 Gb twinax copper 40 GbE optical

System size and weight

The weight of the Brocade VDX 8770-8 can vary considerably depending on the combination of modules installed. Use Table 20 and Table 21 to determine the weight of the Brocade VDX 8770-8 with your combination of modules.

TABLE 20 System size and weight

System	Size or weight
Width	43.99 cm (17.32 in.)
Height	66.22 cm (26.0 in.)/14U
Depth	66.04 cm (26 in.)
Brocade VDX 8770-8 weight: (fully configured) 384-port configuration with eight line cards, including two management modules, six switch fabric modules, four fans, eight power supplies, and one cable management comb	165.56 kg (365 lb)
Empty chassis weight: (includes backplane, cables, bus-bars, power distribution bus, chassis ID card) • No management modules • No switch fabric modules • No line cards • No power supplies • No fans • No cable management devices	61.24 kg (135 lb)

System component weights

Table 21 lists the weights of the compatible modules and FRUs.

TABLE 21 System component weights

FRU	Weight
Management module	2.25 kg (4.95 lb)
Switch fabric module	2.61 kg (5.75 lb)

TABLE 21 System component weights (Continued)

FRU	Weight
48x1G line card	5.85 kg (12.9 lb)
48x10 line card	5.85 kg (12.9 lb)
12x 40G line card	5.40 kg (11.9 lb)
Power supply	2.88 kg (6.35 lb)
Fan assembly	4.76 kg (10.5 lb)
Cable management comb	0.41 kg (0.90 lb)
Line card filler panel	1.72 kg (3.8 lb)
MM/SFM filler panel	.98 kg (2.15 lb)
Power supply filler panel	0.36 kg (0.8 lb)

Ethernet port supported optics

The Ethernet ports in the Brocade VDX 8770-8 support full duplex link speeds at 1, 10, or 40 Gbps inbound and outbound. Table 22 shows the optics supported in the line cards for the Brocade VDX 8770-8.

TABLE 22 Supported optics

Speed	Wavelength	Fiber type	Cable core diameter (microns)	Maximum cable distance
1 GbE	850	MMF	62.5	220 m (721.8 ft)
			62.5	275 m (902.2 ft)
			50	500 m (1640.4 ft)
			50	550 m (1804.5 ft)
	1310	MMF	62.5	550 m (1804.5 ft)
			50	550 m (1804.5 ft)
			50	550 m (1804.5 ft)
		SMF	9	10 km (6.2 mi)
1 GbE Copper SFP	Copper	Cat5	Copper	100 m (328.1 ft)
10 GbE - USR	850	MMF	50	100 m (984.3 ft)
10 GbE - SR	850	MMF	50	300 m (328.1 ft)
10 GbE - LR	1310	SMF	9 or 10	10 km (6.2 mi)
10 GbE twinax	Copper			1 m (3.3 ft)
				3 m (9.8 ft)
				5 m (16.4 ft)
40 GbE	850	MMF	50	100 m (984.3 ft)

The ports meet all required safety standards. For a listing of these standards, refer to "Regulatory compliance".

Power cords

The types of power cords provided with the Brocade VDX 8770-8 are specific to the country where it is installed. For each of the types of power cords in Table 23, the end that connects to the Brocade VDX 8770-8 has an IEC 60320/C19 cable connector. The AC power receptacles on each power supply are equipped with IEC 60320/C20 power connectors.

In order to connect to a power strip already installed in a cabinet, the C20, 20A-250V, 12 AWG power cord is required.

To order a power cord, contact your Brocade VDX 8770-8 supplier.

TABLE 23 Power cord types (international)

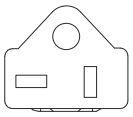
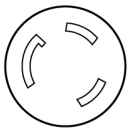
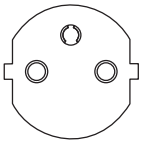
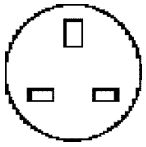
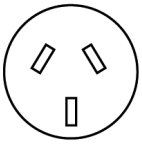
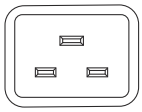
Country	Plug style						
	NEMA 5-20P 125V only USA, Canada, Mexico, other locations	**NEMA L6-20 USA, Canada, Mexico, other locations**	**CEE-7/7 "Schuko" Continental Europe**	**BS-1363A**	**AS 3112 Australia/New Zealand**	**IEC-60309 32A-6h, 230V~**	**C20 20A-250V 12 AWG connect to in-cabinet power strip only All locations**
							
Argentina						X	X
Australia					X		X
Austria			X				X
Bahrain				X			X
Belgium			X				X
Brazil	X	X					X
Chile			X				X
China, People's Rep.					X		X
Czech, Rep. of			X				X
Denmark						X	X
Egypt						X	X
England						X	X
Finland						X	X
France			X				X
Germany			X				X
Greece			X				X
Hong Kong				X			X
Hungary				X			X

TABLE 23 Power cord types (international) (Continued)

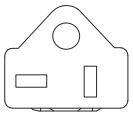
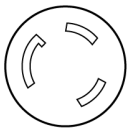
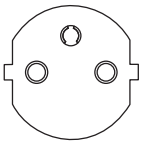
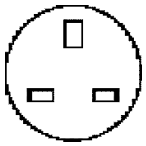
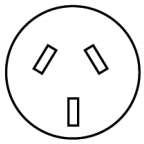
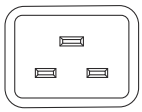
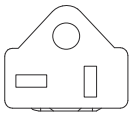
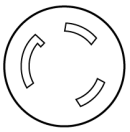
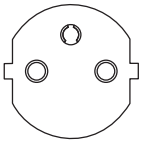
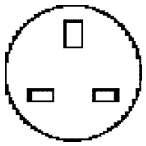
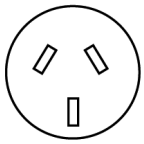
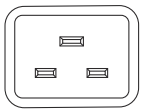
Country	Plug style						
	NEMA 5-20P 125V only USA, Canada, Mexico, other locations	NEMA L6-20 USA, Canada, Mexico, other locations	CEE-7/7 "Schuko" Continental Europe	BS-1363A	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230V~	C20 20A-250V 12 AWG connect to in-cabinet power strip only All locations
							
India						X	X
Indonesia			X				X
Ireland, North				X			X
Ireland, South				X			X
Israel				X			X
Italy						X	X
Japan	X	X					X
Korea, South			X				X
Malaysia			Alternate			Recommended	X
Mexico	X	X					X
Monaco			X				X
Netherlands			X				X
New Zealand					X		X
Norway						X	X
Poland			X				X
Portugal			X				X
Puerto Rico	X	X					X
Russia			X				X
Saudi Arabia			X				X
Scotland						X	X
Singapore				X			X
South Africa				X			X
Spain			X				X
Sweden						X	X
Switzerland						X	X
Taiwan	X	X					X

TABLE 23 Power cord types (international) (Continued)

Country	Plug style						
	NEMA 5-20P 125V only USA, Canada, Mexico, other locations	NEMA L6-20 USA, Canada, Mexico, other locations	CEE-7/7 "Schuko" Continental Europe	BS-1363A	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230V~	C20 20A-250V 12 AWG connect to in-cabinet power strip only All locations
							
Turkey			X				X
United Arab Emirate			X				X
United Kingdom						X	X
United States	X	X					X
Venezuela	X	X					X
Yugoslavia			X				X

Power-cord notice

CAUTION

This switch might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing.

Power-cord notice (Japan, Denan)

注意 – 添付の電源コードを他の装置や用途に使用しない
添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

ATTENTION

Never use the power cord packed with your equipment for other products.

Safety notices

When using this product, observe the danger, caution, and attention notices in this manual. The notices are accompanied by symbols that represent the severity of the safety condition.

NOTE
Translated safety notices are in the *Brocade Product Safety Notices* publication, which is available on *http://my.brocade.com*.

The danger and caution notices are listed in numerical order based on their IDs, which are displayed in parentheses, for example (D004), at the end of each notice. Use this ID to locate the translations of these danger and caution notices in the *Brocade Product Safety Notices*.

NEBS requirements

Table 24 lists the installation requirements for meeting the NEBS GR-1089 compliance.

TABLE 24 NEBS installation requirements for the Brocade VDX 8770-8

Reference	Warning, requirement, or statement
Intrabuilding or Intra-connection	**WARNING**: The intra-building copper Ethernet ports of the equipment or subassembly are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the outside plant (OSP) or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 6) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring
First Level Lightning Criteria AC Power Ports	**WARNING**: The Brocade VDX 8770-8 shall be connected to and external Special Protection Devices (SPD) when installed and connected to commercial AC power.
Class A2 Voltage Accessibility	The Brocade VDX 8770-8 shall be located in a restricted access location were only crafts personnel are allowed access.
Class B Voltage Accessibility	The Brocade VDX 8770-8 shall be located in a restricted access location were only crafts personnel are allowed access.
Equipment Grounding Systems	The Brocade VDX 8770-8 shall be installed and connected to the CBN, IBN or Ether.
Communication Equipment Grounding	The Brocade VDX 8770-8 is suitable for connection to the Central Office.
Bonding of Battery Return (BR) Input Terminals	The battery returns of the Brocade VDX 8770-8 shall be connected as (, DC-I).
Connections	The Brocade VDX 8770-8 shall be grounded via a copper ground conductor.
Connections	All bare grounding connection points to the Brocade VDX 8770-8 shall be cleaned and coated with an anti-oxidant solution before connections are made.
Connections	All surfaces on the Brocade VDX 8770-8 that are un-plated shall be brought to a bright finish and treated with and anti-oxidant solution before connections is made.

TABLE 24 NEBS installation requirements for the Brocade VDX 8770-8

Reference	Warning, requirement, or statement
Connections	All non-conductive surfaces on the Brocade VDX 8770-8 shall be removed from all threads and connection points to ensure electrical continuity
Connections	Brocade VDX 8770-8 utilizes a 2-hole compression type, Agency approved crimped connector with a copper #2 American Wire Guage (AWG) that is utilizes 20 inch pounds of torque to secure it the frame and EUT.
Input DC Voltage	The Brocade VDX 8770-8 is capable of operating at 200-240 V, 50/60 Hz at a maximum current level 16.0 A max., or -48VDC, 70.0 A max. per power supply.

Regulatory compliance

This section describes the regulatory compliance requirements for the Brocade VDX 8770-8. It contains the following standards:

- "FCC warning (US only)" on page 78
- "KCC statement (Republic of Korea)" on page 79
- "VCCI statement (Japan)" on page 79
- "BSMI statement (Taiwan)" on page 79
- "CE statement" on page 79
- "Canadian requirements" on page 80
- "German statement" on page 80
- "Laser compliance" on page 80
- "Safety agency approvals" on page 80
- "Regulatory compliance standards" on page 80

FCC warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

KCC statement (Republic of Korea)

A급 기기 (업무용 방송통신기기): 이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Class A device (Broadcasting Communication Device for Office Use): This device obtained EMC registration for office use (Class A), and may be used in places other than home. Sellers and/or users need to take note of this.

VCCI statement (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるように要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance might arise. When such trouble occurs, the user might be required to take corrective action.

BSMI statement (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

Warning:

This is Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

CE statement

This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures.

The standards compliance label on the product contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

- Electromagnetic Compatibility (EMC) Directive 2004/108EEC
- Low Voltage Directive (LVD) 73/23/EEC and the Complementary Directive 93/68/EEC
- EN55022:2006 (European Emissions Requirements)
- EN55024:1998, +A1:2001 and +A2:2003 (European Immunity Requirements)
- EN61000-3-2:2006/JEIDA (European and Japanese Harmonics Spec)
- EN61000-3-3:1995, +A1:2001 and +A2:2005

Canadian requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

German statement

Maschinenlärminformations-Verordnung – 3 GPSGV, der höchste Schalldruckpegel beträgt 79.0 dB(A) gemäss EN ISO 7779.

Machine noise information regulation – 3. GPSGV, the highest sound pressure level value is 79.0 dB(A) in accordance with EN ISO 7779.

Laser compliance

This equipment contains Class 1 laser products and complies with FDA Radiation Performance Standards, 21 CFR Subchapter I and the international laser safety standard IEC 825-2.

Use only optical transceivers that are qualified by Brocade Communications Systems, Inc. and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 825-2. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

Safety agency approvals

- CAN/CSA-C22.2 No. 60950-1-07/UL60950-1 - Second Edition, Safety of Information Technology Equipment
- EN 60825-1 Safety of Laser Products - Part 1: Equipment Classification, Requirements and User's Guide
- EN 60825-2 Safety of Laser Products - Part 2: Safety of Optical Fibre Communications Systems
- EN 60950-1:2006\IEC 60950-1:2005, Second Edition, Safety of Information Technology Equipment

Regulatory compliance standards

Table 25 lists the regulatory compliance standards for which the Brocade VDX 8770-8 is certified.

TABLE 25 Regulatory compliance standards

Country	Standards		Agency Certifications and Markings	
	Safety	EMC	Safety	EMC
United States	Bi-Nat UL/CSA 60950-1 2nd Ed or latest	ANSI C63.4	cCSAus	FCC Class A and Statement
Canada	Bi-Nat UL/CSA 60950-1 2nd Ed or latest	ICES-003 Class A	cCSAus	ICES A and Statement

TABLE 25 Regulatory compliance standards (Continued)

Country	Standards		Agency Certifications and Markings	
	Safety	EMC	Safety	EMC
Japan		CISPR22 and JEIDA (Harmonics)		VCCI-A and Statement
European Union	EN60950-1 2nd Ed or latest	EN55022 and EN55024	TUV-GS, N	CE marking
Australia, New Zealand		EN55022 or CISPR22 or AS/NZS CISPR22		C-Tick mark
Argentina	IEC60950-1 2nd Ed or latest		"S" mark	
Russia	IEC60950-1 2nd Ed or latest	51318.22-99 and 51318.24-99 or latest	GOST mark	GOST mark
Korea		KN22 and KN24		KC mark Class A
China (PS only)	GB4943-2001 and GB9254-1998 or latest	GB17625.1-2003 or latest	CCC logo	CCC logo
Taiwan (PS only)	CNS 14336(94) or latest	CNS 13438(95) or latest	BSMI mark	BSMI mark

Environmental regulation compliance

This section describes the China RoHS environmental regulatory compliance requirements for the Brocade VDX 8770-8.

China RoHS

The contents included in this section are per the requirements of the People's Republic of China-Management Methods for Controlling Pollution by Electronic Information products.

遵守环境法规
中国 **RoHS**
本节中包含的内容都遵守了中华人民共和国《电子信息产品污染控制管理办法》的要求。

Environmental Protection Use Period (EPUP) Disclaimer

In no event do the EPUP logos shown on the product and FRUs alter or expand that warranty that Brocade provides with respect to its products as set forth in the applicable contract between Brocade and its customer. Brocade hereby disclaims all other warranties and representations with respect to the information contained in this document including the implied warranties of merchantability, fitness for a particular purposes and non-infringement.

The EPUP assumes that the product will be used under normal conditions in accordance with the operating manual of the product.

环保使用期限 **(EPUP)** 免责声明：

EPUP 标志不会出现在产品和 FRU 的改装产品中，也不会对 Brocade 所提供的相关产品保修条款（该保修条款在 Brocade 及其客户间达成的适用合同中列出）进行增补。对于此 CD 上包含的相关信息，如适销性、针对特定用途的适用性和非侵权性的暗示保证，Brocade 在此郑重声明本公司对于与上述信息相关的所有其他保证和陈述概不负责。EPUP 假设在“产品操作手册”中注明的常规条件下使用该产品。

China RoHS hazardous substances/toxic substances (HS/TS) concentration chart

In accordance with China's Management Measures on the Control of Pollution caused by Electronic Information products (Decree No. 39 by the Ministry of Information Industry), the following information is provided regarding the names and concentration level of hazardous substances (HS) which may be contained in this product.

有毒有害物质或元素名称及含量标识
Toxic / Hazardous Substances and Elements Table

部件名称	有毒有害物质或元素					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr(VI)）	多溴联苯（PBB）	多溴二苯醚（PBDE）
光纤通道交换机 Fiber Channel Switch	×	O	O	O	O	O
风扇/冷却组装件 Fan, Blower Assemblies	×	O	O	O	O	O
线路板部件 PCBA Cards	×	O	O	O	O	O
主机总线适配 (HBA) Host Bus Adapter (HBA)	×	O	O	O	O	O
USB 闪存器 USB Flash Drive	O	O	O	O	O	O
电源 Power Supply Kit	×	O	O	O	O	O
光纤模块 SFP Optics	×	O	O	O	O	O
钣金件 Sheet Metal	×	O	O	O	O	O
机箱部件 Chassis Assembly	×	O	O	O	O	O
机械支架及滑轨 Mechanical Brackets & Slides	×	O	O	O	O	O
插槽填充物 Slot Filler	×	O	O	O	O	O
电缆整理盘 Cable Management Tray	×	O	O	O	O	O
梳状线缆 Cable Comb	×	O	O	O	O	O
线束及电源线 Cables and Power Cords	O	O	O	O	O	O
替换门 Replacement Doors	×	O	O	O	O	O
电池 Battery	O	O	O	O	O	O
软件/文档光盘 Software/Documentation CDs	O	O	O	O	O	O

O：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363—2006规定的限量要求以下。

○: Indicates that the content of the toxic and hazardous substance in all the homogeneous materials of the part is below the concentration limit requirement as described in SJ/T 11363-2006.

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363—2006规定的限量要求。

×: Indicates that the content of the toxic and hazardous substance in at least one homogeneous material of the part exceeds the concentration limit requirement as described in SJ/T 11363-2006.

A Environmental regulation compliance

Appendix

Caution and Danger Notices

B

In this appendix

- Caution notices 85
- Danger notices. 87

Caution notices

The cautions and dangers that appear in this manual are listed below in English, German, French, and Spanish.

A caution calls your attention to a possible hazard that can damage equipment.

"Vorsicht" weist auf eine mögliche Beschädigung des Geräts hin. Sie finden die folgenden Vorsichtshinweise in diesem Handbuch.

Une mise en garde attire votre attention sur un risque possible d'endommagement de l'équipement. Ci-dessous, vous trouverez les mises en garde utilisées dans ce manuel.

Un mensaje de precaución le advierte sobre un posible peligro que pueda dañar el equipo. Las siguientes son precauciones utilizadas en este manual.

CAUTION	All devices with DC power supplies (Brocade VDX 8770-8) are intended for installation in restricted access areas only. A restricted access area is where access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.
VORSICHT	Alle Geräte mit Direktstromquellen (Brocade VDX 8770-8) sind nur zur Installation in Sperrbereichen bestimmt. Ein Sperrbereich ist ein Ort, zu dem nur Wartungspersonal mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer anderen Schutzvorrichtung Zugang hat. Er unterliegt außerdem der Kontrolle durch die für den Standort verantwortliche Stelle.
MISE EN GARDE	Tous les équipements dotés d'un bloc d'alimentation en courant continu (Brocade VDX 8770-8) sont conçus pour l'installation dans des zones à accès réglementé uniquement. Une zone à accès réglementé est un local qui n'est accessible que par le personnel d'entretien à l'aide d'un outil, verrou ou clé conçus à cet effet, ou de tout autre accessoire de sécurité, et qui est contrôlé par l'autorité responsable de ce local.
PRECAUCIÓN	Todos aquellos dispositivos con fuentes de alimentación de CC (Brocade VDX 8770-8) están diseñados para su instalación en zonas de acceso restringido solamente. Una zona de acceso restringido es un lugar al que sólo puede acceder personal de mantenimiento haciendo uso de una herramienta especial, una llave y un candado, o algún otro medio de seguridad, y que está controlado por la autoridad responsable.

CAUTION	For the DC input circuit to the system of a Brocade VDX 8770-8 (3000W supply) make sure there is a 80 amp circuit breaker, minimum -48Vdc, double pole, on the input lugs to the power supply. The input wiring for connection to the product should be Listed copper wire, 4 AWG, marked VW-1, and rated minimum 90o C.
VORSICHT	Bei der Gleichstromeingangsschaltung zum System eines Brocade VDX 8770-8 (3000W supply), muss sichergestellt werden, dass an den Eingangskabelschuhen zur Stromversorgung ein zweipoliger Schalter mit UL-Zulassung, 80 Ampere und mindestens -48 V Gleichstrom vorhanden ist. Die Eingangsleitung zum Anschluss an das Produkt sollte als Kupferdraht, 4 AWG, angegeben, als VW-1 gekennzeichnet und für mindestens 90 °C bemessen sein.
MISE EN GARDE	Pour le circuit d'alimentation en courant continu du système Brocade VDX 8770-8 (3000W supply), vérifier la présence d'un disjoncteur bipolaire homologué de 80 A, minimum -48 Vcc, sur l'entrée de l'alimentation. Les câbles d'alimentation du produit doivent être des fils de cuivre homologués de section 10 mm^2 (4 AWG), marqués VW-1 et testés à 90° C.
PRECAUCIÓN	Para el circuito de entrada de CC al sistema de un Brocade VDX 8770-8 (3000W supply), verifique que existe un disyuntor catalogado por UL de 80 amperios, -48VCC como mínimo, bipolar, en las orejetas de entrada a la fuente de alimentación. El cableado de entrada para la conexión al producto deberá ser de cable de cobre catalogado, 4 AWG, marcado con VW-1, y tener una capacidad nominal mínima para 90°C.

CAUTION	Do not install the device in an environment where the operating ambient temperature might exceed 40° C (104° F).
VORSICHT	Das Gerät darf nicht in einer Umgebung mit einer Umgebungsbetriebstemperatur von über 40° C (104° F) installiert werden.
MISE EN GARDE	N'installez pas le dispositif dans un environnement où la température d'exploitation ambiante risque de dépasser 40° C (104° F).
PRECAUCIÓN	No instale el instrumento en un entorno en el que la temperatura ambiente de operación pueda exceder los 40° C (104° F).

CAUTION	Use a separate branch circuit for each AC power cord, which provides redundancy in case one of the circuits fails.
VORSICHT	Es empfiehlt sich die Installation eines separaten Stromkreiszweiges für jede Wechselstrom-Elektroschnur als Redundanz im Fall des Ausfalls eines Stromkreises.
MISE EN GARDE	Utilisez un circuit de dérivation différent pour chaque cordon d'alimentation C.A. Ainsi, il y aura un circuit redondant en cas de panne d'un des circuits.
PRECAUCIÓN	Use un circuito derivado separado para cada cordón de alimentación de CA, con lo que se proporcionará redundancia en caso de que uno de los circuitos falle.

CAUTION:	All devices with AC power sources are intended for installation in restricted access areas only. A restricted access area is a location where access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security.
VORSICHT	Alle Geräte mit Wechselstromquellen sind nur zur Installation in Sperrbereichen bestimmt. Ein Sperrbereich ist ein Ort, zu dem nur Wartungspersonal mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer anderen Schutzvorrichtung Zugang hat.
MISE EN GARDE	Tous les équipements dotés de sources d'alimentation électrique secteur sont destinés à être installés uniquement dans des zones à accès réglementé. Une zone à accès réglementé est une zone dont l'accès n'est possible qu'au personnel de service utilisant un verrou, une clé ou un outil spécial, ou d'autres moyens de sécurité.
PRECAUCIÓN	Todos aquellos dispositivos con fuentes de alimentación de CA están diseñados para su instalación en zonas de acceso restringido solamente. Una zona de acceso restringido es un lugar al que sólo puede acceder personal de mantenimiento haciendo uso de una herramienta especial, una llave y un candado, o algún otro medio de seguridad.

CAUTION	For a Brocade VDX 8770-8 AC system, use a ground wire of at least 2 American Wire Gauge (AWG). The ground wire should have an agency-approved crimped connector (provided with the chassis) attached to one end, with the other end attached to building ground. The connector must be crimped with the proper tool, allowing it to be connected to both ground screws on the enclosure.
VORSICHT	Für ein Wechselstromsystem Brocade VDX 8770-8 ist ein Erdleiter von mindestens 2 AWG (amerikanische Norm für Drahtquerschnitte) zu verwenden. An einem Ende des Erdleiters sollte ein geprüfter gecrimpter Anschluss (mit Chassis bereitgestellt) angebracht sein. Das andere Ende sollte an der Gebäudeerdung angeschlossen werden. Der Anschluss muss mit dem richtigen Werkzeug gecrimpt werden, so dass er an beiden Erdungsschrauben am Gehäuse angeschlossen werden kann.
MISE EN GARDE	Pour un système à alimentation secteur Brocade VDX 8770-8, utiliser un câble de mise à la terre de calibre AWG 2 (25 mm^2) minimum. Ce fil de terre doit être équipé d'un côté d'un connecteur à sertir agréé (fourni avec le châssis), et l'autre extrémité doit être reliée à la terre du bâtiment. Ce connecteur doit être serti à l'aide de l'outil approprié afin d'être raccordé aux deux vis de mise à la terre du boîtier.
PRECAUCIÓN	Para un sistema de CA Brocade VDX 8770-8, utilice un conductor de tierra de al menos 2 CAE (Calibre de Alambre Estadounidense, American Wire Gauge o AWG en sus siglas en inglés). El conductor de tierra debe tener un conector rizado homologado (suministrado con el chasis) acoplado a un extremo, y el otro extremo debe estar conectado a la tierra del edificio. El conector debe rizarse con la herramienta apropiada, de manera que se conecte a los dos tornillos de tierra del recinto.

Danger notices

A danger calls your attention to a possible hazard that can cause injury or death. The following are the dangers used in this manual.

"Gefahr" weist auf eine mögliche Gefährdung hin, die zu Verletzungen oder Tod führen können. Sie finden die folgenden Warnhinweise in diesem Handbuch.

Un danger attire votre attention sur un risque possible de blessure ou de décès. Ci-dessous, vous trouverez les dangers utilisés dans ce manuel.

Una advertencia le llama la atención sobre cualquier posible peligro que pueda ocasionar daños personales o la muerte. A continuación se dan las advertencias utilizadas en este manual.

DANGER	Laser Radiation. Do Not View Directly with Optical Instruments. Class 1M Laser Products.
GEFAHR	Laserstrahlung! Schauen Sie nicht direkt mit optischen Instrumenten in den Laserstrahl herein. Klasse 1M Laserprodukte.
DANGER	Rayonnement de laser. Ne regardez pas directement avec les instruments optiques. Produits de laser de la classe 1M.
PELIGRO	Radiacion de Laser. No vea directamente con Instrumentos Opticos. Clase 1M de Productos de Laser.

DANGER	All fiber optic interfaces use Class 1 lasers.
GEFAHR	Alle Glasfaser-Schnittstellen verwenden Laser der Klasse 1.
DANGER	Toutes les interfaces en fibres optiques utilisent des lasers de classe 1.
PELIGRO	Todas las interfaces de fibra óptica utilizan láser de clase 1.

DANGER	Installation and removal of the unit must be carried out by qualified personnel only.
GEFAHR	Die Installation und Entfernung der Einheit dürfen nur von qualifiziertem Personal ausgeführt werden.
DANGER	L'installation et la dépose de l'unité doivent être confiées uniquement à du personnel qualifié.
PELIGRO	La instalación y desinstalación de la unidad debe llevarse a cabo solamente por personal cualificado.

DANGER	Disconnect the power cord from all power sources to completely remove power from the device.
GEFAHR	Ziehen Sie das Stromkabel aus allen Stromquellen, um sicherzustellen, dass dem Gerät kein Strom zugeführt wird.
DANGER	Débranchez le cordon d'alimentation de toutes les sources d'alimentation pour couper complètement l'alimentation du dispositif.
PELIGRO	Para desconectar completamente la corriente del instrumento, desconecte el cordón de corriente de todas las fuentes de corriente.

DANGER	If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.
GEFAHR	Falls für die Installation ein anderes Stromkabel erforderlich ist (wenn das mit dem Gerät gelieferte Kabel nicht passt), müssen Sie sicherstellen, dass Sie ein Stromkabel mit dem Siegel einer Sicherheitsbehörde verwenden, die für die Zertifizierung von Stromkabeln in Ihrem Land zuständig ist. Das Siegel ist Ihre Garantie, dass das Stromkabel sicher mit Ihrem Gerät verwendet werden kann.
DANGER	Si l'installation nécessite un cordon d'alimentation autre que celui fourni avec le dispositif, assurez-vous d'utiliser un cordon d'alimentation portant la marque de l'organisation responsable de la sécurité qui définit les normes et régulations pour les cordons d'alimentation dans votre pays. Cette marque vous assure que vous pouvez utiliser le cordon d'alimentation avec le dispositif en toute sécurité.
PELIGRO	Si la instalación requiere un cordón de corriente distinto al que se ha suministrado con el instrumento, verifique que usa un cordón de corriente que venga con la marca de la agencia de seguridad que defina las regulaciones para cordones de corriente en su país. Esta marca será su garantía de que el cordón de corriente puede ser utilizado con seguridad con el instrumento.

DANGER	High Touch Current. Earth connection essential before connecting supply (Brocade VDX 8770-8).
GEFAHR	Hoher Ableitstrom. Vor Anschluss ans Netz Schutzerdung herstellen. (Brocade VDX 8770-8)
DANGER	Courant de fuite élevé. Mise à la terre obligatoire avant la connexion de l'alimentation (Brocade VDX 8770-8).
PELIGRO	Alta tensión al tacto. La conexión a tierra es esencial antes de conectar la alimentación (Brocade VDX 8770-8).

B Danger notices

Index

A

accessing NTP server, *29*
airflow, requirement, *15*
altitude, requirement, *15*
ambient temperature, requirement, *15*

B

back up configuration, *31*
Brocade ISLs, *72*
Brocade trunking, *34*, *72*
BSMI statement (Taiwan), *79*

C

cable management comb, replacing, *48*
cables
  attach SFP, *32*
  managing, *34*
Canadian requirement, *80*
caution statements, translated, *85*
CE statement, *79*
certifications, *71*, *78*, *80*
chassis
  hardware components, *2*
  weight and size, *72*
chassis ID card, see CID card
chassis name, customizing, *27*
China RoHS, *81*
CID card, *64*
  determining status, *46*
  recovery options, *65*
CID recovery tool, *64*
classes of service, *71*
clock set command, *29*
clock timezone command, *28*, *29*
command
  clock set, *29*
  clock timezone, *28*, *29*
  configure terminal, *25*
  copy, *31*
  copy running-config startup-config, *30*
  ip address, *25*
  ip gateway-address, *25*
  logout, *26*
  no ntp server, *29*
  ntp server, *28*, *29*
  show chassis, *31*, *44*
  show clock, *30*
  show environment, *44*
  show environment power, *43*
  show fabric all, *31*, *33*
  show interface, *31*, *33*
  show interface management, *40*
  show license, *30*
  show license id, *30*
  show linecard, *35*
  show mm, *40*
  show ntp status, *29*
  show running-config, *26*
  show sfm, *41*
  show slots, *35*, *41*
  show system, *43*, *45*
  switch-attributes, *27*
  username, *25*
  vcs rbridge-id, *24*
compliance, environmental regulation, *81*
configuration, *22*
  backup, *31*
  date and time, *28*
  persist, *30*
  switch IP address, *25*
  verify, *31*
configure terminal command, *25*
connecting
  Ethernet devices, *32*
  workstations, servers, routers, *32*
copy command, *31*
copy running-config startup-config command, *30*
crossover cable, *32*

customizing
chassis name, *27*
host name, *27*

D

danger statements, translated, *87*
distributed intelligence, *22*

E

environmental regulation compliance, *81*
Ethernet fabric, *22*
Ethernet ports, *71*
Ethernet, establish connection, *26*
event date and time, *28*

F

fan
replacing, *60*
status, *44*
fan LEDs, *46*
FCC warning (US only), *78*
field-replaceable units. See FRUs
filler panel, replacing, *62, 63*
FRUs
cable management comb, replacing, *48*
fan, *44*
LEDs, *46*
replacing, *60*
filler panel, replacing, *62, 63*
line card, replacing, *49*
MM
LEDs, *40*
replacing, *52*
power supply, *43*
LEDs, *44*
replacing, *57*
QSFP transceivers, replacing, *67*
SFM
LEDs, *42*
replacing, *54*
SFP, *32*
transceivers, replacing, *65*
weights, *72*
FTP, backing up via, *31*

G

Gigabit NICs, *32*

H

hardware components, *2*
high availability, *5*
host name
customizing, *27*
length, *27*
humidity, requirement, *15*

I

installation
items required, *13*
SFP, *32*
tasks, *9*
installed licenses, *30*
international power cords, *74*
inter-switch links, see ISLs
ip address command, *25*
ip gateway-address command, *25*
ISLs, *34*

K

KCC statement (Republic of Korea), *79*

L

laser compliance, *80*
latency
port to port, *71*
LEDs
fan, *46*
line card, *38*
MM, *40*
power supply, *44*
SFM, *42*
license, chassis software, *30*
line card
determining status, *35*
replacing, *49*

line card LEDs, *38*
local clock, *29*
LOCL, *29*
logging, date and time, *28*
logout command, *26*

M

management module, *71*
management module, see MM
managing cables, *34*
media types, *72*
MM
    determining status, *40*
    LEDs, *40*
    replacing, *52*
modules, weight, *72*

N

NEBS GR-1089 requirements, *77*
network connectivity, testing, *32*
no ntp server command, *29*
notices, safety, *77*
NTP server access, *29*
ntp server command, *28, 29*
numbering, port, *17*

P

persist configuration, *30*
port
    Ethernet, *71*
    numbering, *17*
power cord
    notice, Japan DENAN, *76*
    types, *74*
power cords, listed by type and country, *74*
power requirements, *13*
power supply
    LEDs, *44*
    replacing, *57*
    status, *43*
power, providing, *18*

Q

QSFP transceivers
    installing, *33*
    replacing, *67*
quad small form-factor pluggable (transceivers), see QSFP transceivers

R

rack space requirement, *12*
recovering CID card, *64*
recovery options, CID recovery tool, *65*
regulatory compliance, *78*
removing SFM, *55*
replacing a power supply, *57*
replacing fan, *60*
replacing filler panel, *62, 63*
replacing MM, *52*
replacing QSFP transceivers, *67*
replacing SFM, *56*
replacing transceivers, *65*
requirements
    NEBS GR-1089, *77*
running configuration, backing up, *31*

S

safety guidelines, *12*
safety notices, *77*
SCP, backing up via, *31*
serial connection, establishing, *22*
serial port logout, *26*
setting
    date and time, *28*
    static IP address, *25*
    time zone, *29*
SFM
    determining status, *41*
    LEDs, *42*
    removing, *55*
    replacing, *54, 56*
SFPs, *32*
shock requirement, *15*
show chassis command, *31, 44*
show clock command, *30*
show environment command, *44*

show environment power command, *43*
show fabric all command, *31*, *33*
show interface command, *31*, *33*
show interface management command, *40*
show license command, *30*
show license id command, *30*
show linecard command, *35*
show mm command, *40*
show ntp status command, *29*
show running-config command, *26*
show sfm command, *41*
show slots command, *35*, *41*
show system command, *43*, *45*
site planning, *12*
size and weight, chassis, *72*
small form-factor pluggable (transceivers), see SFPs
specifications, general, *71*
startup configuration, backing up, *31*
static IP address
    IPv4, *25*
    IPv6, *26*
status
    CID card, *46*
    fan, *44*
    line card, *35*
    MM, *40*
    power supply, *43*
    SFM, *41*
straight-through cable, *32*
supported optics, *73*
switch fabric module, see SFM
switch IP address, *25*
    static, *25*
switch name. See host name
switch, connect to, *24*
switch-attributes command, *27*
synchronize local time using NTP, *29*
system architecture, *71*
system processor, *71*

T

tasks, installation, *9*
terminal emulator, configuring, *23*
testing network connectivity, *32*
time and date, *28*
time zone
    explanation, *28*
    setting, *29*
tool, extraction, transceivers, *65*
trademarks, *xvi*
transceivers
    extraction tool, *65*
    replacing, *65*
    supported types, *11*
trunk group, *34*

U

USB device
    backing up to, *31*
username command, *25*
UTP cable, *32*

V

VCCI statement, *79*
VCS, *1*
VCS mode, *22*
vcs rbridge-id command, *24*
VCS trunking, *34*
verify configuration, *31*
vibration, requirement, *15*

W

weight
    chassis, *72*
    modules, *72*